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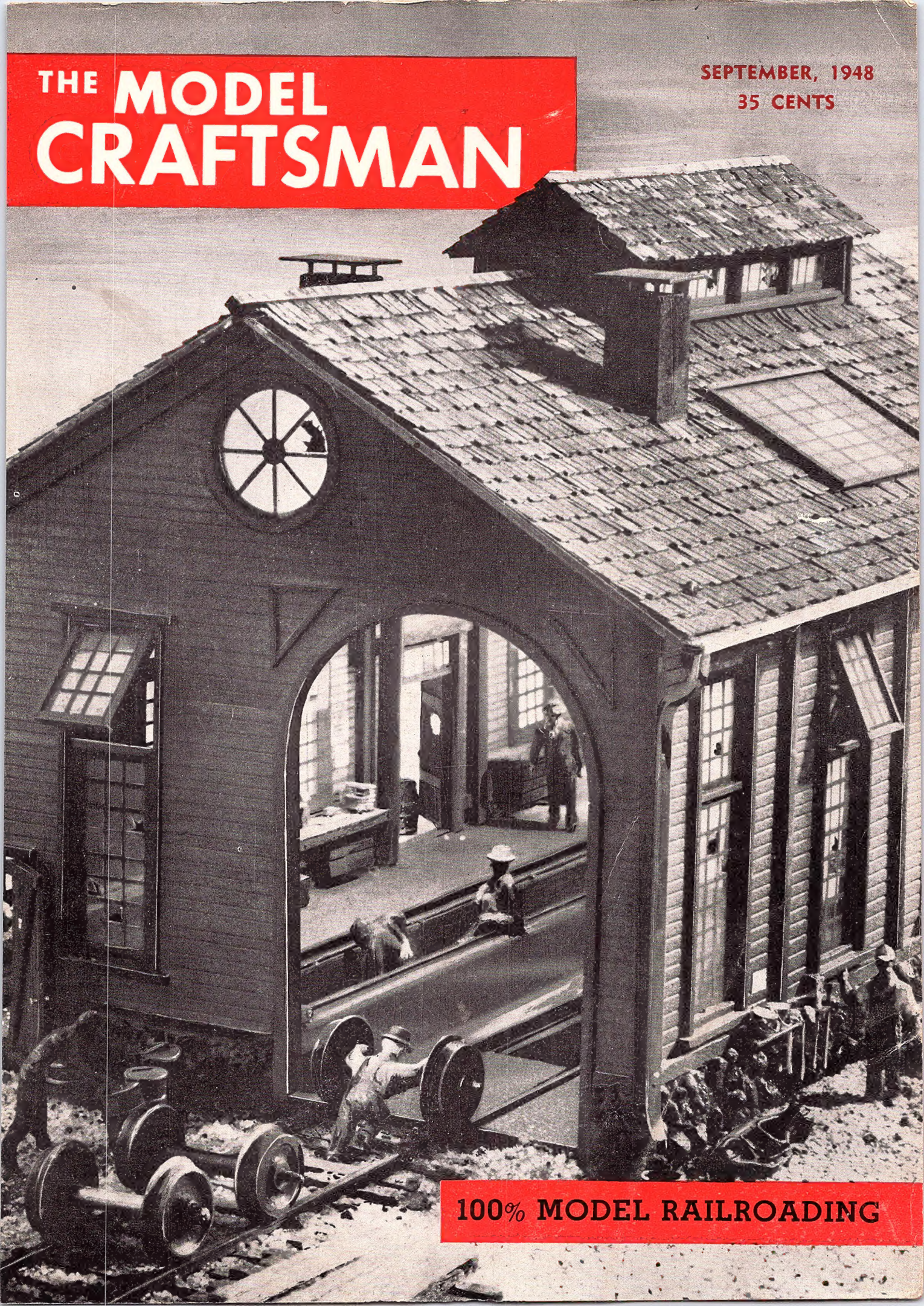

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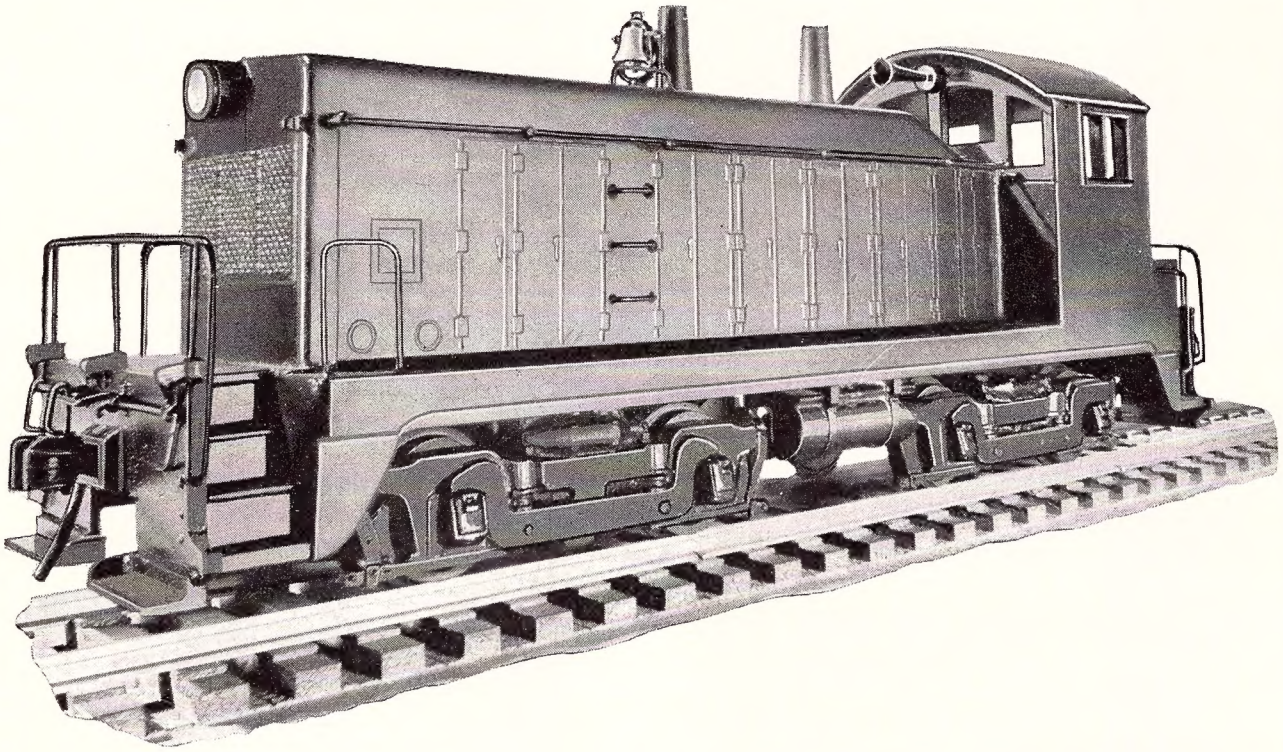

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THE MODEL CRAFTSMAN

Vol. 17, No. 4 September, 1948

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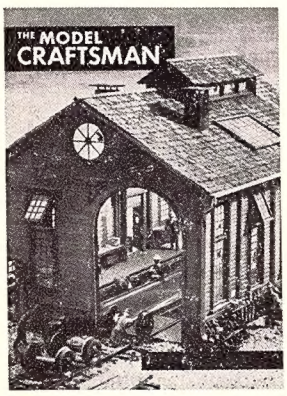

Old Time, two stall engine-house built by John Allen of Monterey, California in HO gauge. Like the detail on this model? It will be described in full, well illustrated, in the October issue of M. C.

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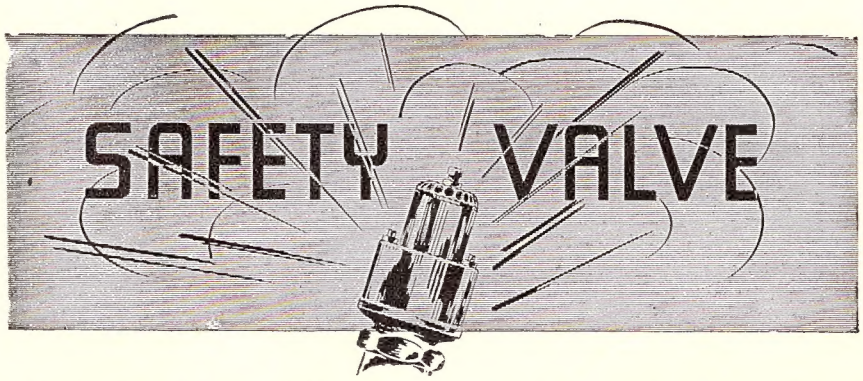

HE'S MET THE GOVERNOR

Your July issue was very fine. Of special interest to me was the "Once Upon a Rail" showing plans for the "Governor Corbett" and Trailer Car. While dummy engines are a thing of the past in this country, they are still to be found in Belgium. At least in 1945 there were several running in and out of Hasselt. Some of the dummy engines over there have six drivers. The trailers that were used with the dummy engines were very much like the one in your published plans except the end platforms were very narrow.

I would like to see you publish plans for a 2-4-2 Columbia type locomotive. The Warrenton Railroad in North Carolina has one with a sloping tender. I see by the July Safety Valve there is one in service near Nanaimo, B. C. Plans for the 2-10-0 "Decapod" that was built for the Russians and then sold to various lines in the U. S. would also be interesting. This is an engine with many drivers and yet small enough to be used on branch lines . . . . Ralph W. Moore, Gary, Indiana.

CORRECT POWER TRUCKS

I want to compliment you again on your fine mag (see my postal of a few days ago). If you don't mind, I'll take the liberty to express my opinion of the Safety Valve. As a whole, it was fine but may the writer of the second letter take note. Red Ball Models distribute a power truck (Lindsay) with adjustable wheelbase to fit anything from 7 to 8½ feet (scale). This truck is 15 bucks complete with St. Louis, Baldwin or Taylor side frames and a trail truck. The payoff is that this truck doesn't stick up more than ½ inch into the car and is in the middle like a tank car dome so that the car it is under can take very sharp curves—I thank you . . . Paul Miller, Ft. Wayne 8, Ind.

STEAM FAN CALLS HIS SHOT

What's wrong with the Live Steam movement? What's happened to the energy and enthusiasm so much in evidence back in 1940? In Britain, the homeland of the model engineer, the Live Steamers are progressing by leaps and bounds, devising new methods, scaling new heights, building ever larger and more complicated outdoor passenger carrying tracks, and all under the most severe shortages and austere conditions.

In America, the land of go-ahead, bigger and better, we lead, others follow, etc., the "live steam" pressure has practically dropped to zero, a thin, wispy puff at long intervals indicating that a spark of life still flickered.

What IS wrong? The small electric layouts grow larger and larger, their costs running into astronomical figures; the small race cars craze is sweeping the country, with big sponsors, reams of publicity, and tracks mushrooming all over the land. The model aeroplane fellows are holding regional and national meets everywhere, thousands of people attending their well-publicized gatherings.

But the pioneer loco builder, the REAL model engineer, seems as extinct as the Dodo, (power-boat and sail boat enthusiasts miracueously seem to thrive without need of outside assistance, as witness the faithful groups trying out their craft on any Sunday morning in any city or town boasting a suitable park lake for their operation).

Actually, of course, the Live Steamers are today more numerous, more capable, ever improving their little engines, than even in 1940, the golden age of Live Steam. There are more outdoor tracks, more locomotives, greater plans for the future—but all this is clandestine, disjointed. All this goes on behind an iron curtain of—SILENCE!

There is no common ground for the exchange of ideas, or for the scattered brothers to keep informed of latest developments. Outside of the annual Danvers meet of the New England Live Steamers and a few isolated meets spread over the continent which receive only local publicity, there is no inkling of what goes on. These groups seem to have grown staid, they are complacent, have their regular meetings, hold meets, etc; self-satisfied, self-sufficient.

But what of the forgotten "lone hand", the back-bone of the Live Steam movement? He works in the dark, not knowing of improved methods, new blobs and gadgets. I, who have seen the little pint-sized Modelmaker of 1924 with its six or seven pages, blossom into the slick, proud magazine of 1940, know that it was this humble little "rag" which brought the disjointed, obscure "lone hands" together into a strong unified brotherhood, each helping the other, through the common meeting ground of its pages. Such stalwarts as Harry Sait, Charles Purinton,

(*Continued on page* 43)

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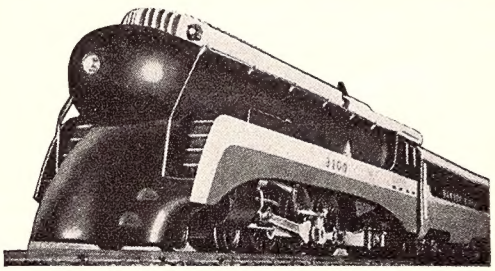

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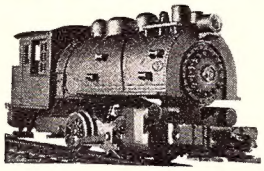

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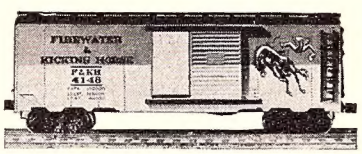

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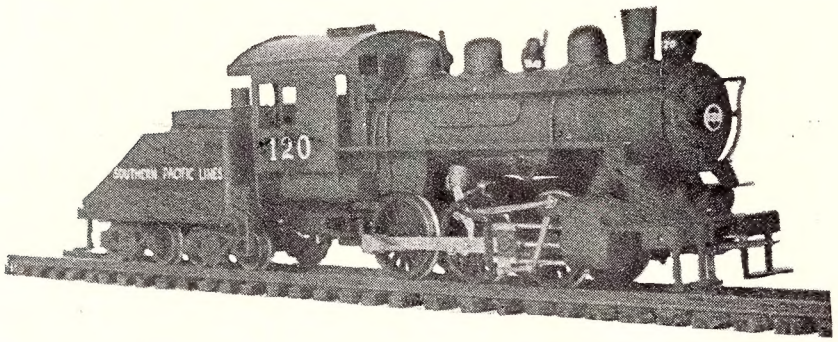


An 0-6-0 Southern Pacific Switcher built up in HO gauge by the author.

Southern Pacific 0-6-0 Switcher

PART II **By LEWIS AUSTIN**

THIS month I will describe the construction of the cylinder block, valve gear and everything else needed to complete the mechanism. The cylinder block is completely built up out of brass. The method used is clearly shown on the drawing. Use a block of brass ⅜" by ¾" by 1½" long and saw and file the cutout for mounting the cylinder block on the loco frame. Then drill the $\frac{5}{16}$" holes for the steam cylinders, the $\frac{3}{16}$" holes for the valve cylinders and also the two ⅛" holes to form the radii in the corners of the block. Make the valve and steam cylinders out of lengths of $\frac{3}{16}$" and $\frac{5}{16}$" brass rod. The cylinders are then sweat-soldered in place in the holes in the cylinder block and the ends of the cylinders finished off with a file. Drill the #60 holes for the crosshead guides and drill #57 holes for the piston rods and valve piston rods.

Drill a $\frac{3}{32}$" hole about ⅛" deep in the center of each valve cylinder and solder a length of $\frac{3}{32}$" brass rod in each hole. The rod is then slit down the center with a hacksaw and then filed to the shape shown on the side view of the cylinder block. This represents the guides for the valve crosshead.

The cylinder block can now be sawed and filed to its finished shape as shown on the drawing. When filing around the valve and steam cylinders, be sure that you do not go to close and file right through to the cylinders. Stay away about 1/64" from the cylinders. The crosshead guides, which are simply lengths of #60 wire, can now be pressed into the holes drilled for them. Cut off the ends of the guides and make them the length shown on the drawing.

Use $\frac{3}{16}$" brass rod for the two pipes on the cylinder block. Drill $\frac{3}{16}$" holes on the angle shown and solder the brass rod in the holes. File the $\frac{7}{16}$" radius on the top of the cylinder block and solder a plate made out of $\frac{1}{32}$" sheet brass in place as shown on the drawing. Drill and tap the three 2-56 holes as shown and the cylinder block is completed.

The crossheads are filed to shape out of $\frac{3}{32}$" thick brass. Use care when sawing and filing the slots for the crosshead guides so that you get a good sliding fit. Drill a $\frac{1}{16}$" hole through the center of each crosshead and a #60 hole in the end. Solder a piece of #60 wire in the end of each crosshead to serve as a piston rod. Counterbore the $\frac{1}{16}$" hole in the center of the crosshead to accommodate the 0-80 hex head screw that will be used to fasten the main rod to the crosshead. The small triangular piece at the bottom of each crosshead is cut out of 1/64" sheet brass and soldered in place. Purchase some tiny brass rivets for assembling the valve gear and drill a hole in the bottom of each triangular piece to fit the rivets. The hole should be slightly larger than the rivets for the rivets will expand in the center when they are pressed in place. So much for the crossheads.

Make the main rods out of the same material that you used for the side rods. One end of the main rod is tapped 0-80 so it can be fastened to the crosshead and the other end is drilled to fit the crankpins on the rear pair of drivers. Mount the cylinder block, crossheads and main rods on the model and roll it on your bench top to make sure everything works freely.

Use the motor that Pittman manufactures for use in the smaller locos of the Mantua line. It is listed in the Mantua catalog. This motor is mounted with one 2-56 screw at the front and another 2-56 screw at the rear that screws into a die-cast block on the motor. Drill $\frac{3}{32}$" holes through the frame in the correct locations. One hole will have to be drilled right through both the bottom plate and frame. The correct locations of the holes can best be taken right from the motor. I used a Varney worm and gear set on my model but it is possible to use practically any make of gear set as long as the ratio is low enough so that the loco does not travel too fast. In order to get the gears to mesh properly you can file some metal off the rear mounting block on the motor or you can place washers under the front end of the motor.

The valve gear is made next. As I mentioned in part 1 of this series, it is possible to mount the Varney valve gear on the model. If you are a beginner in model railroading this will save you a good deal of work. It takes a lot of patience to file out the tiny rods and other parts. The valve gear that will fit the model is the set used on the Varney Consolidation so be sure that you specify that type when you order it.

The valve gear on my model was made entirely out of 1/64" sheet brass. Lay out all the rods on the sheet brass and drill the holes for the rivets. The sizes of the rods can be taken right from the drawing of the valve gear assembly. The size of the holes will depend on the size of the rivets you are using. When the holes are all drilled, cut the rods out of the sheet brass. The rods will be curled and distorted after they are out but they can be straightened with pliers and then filed to their finished shapes. A good way to hold the rods while filing them is to clamp them in a small parallel clamp.

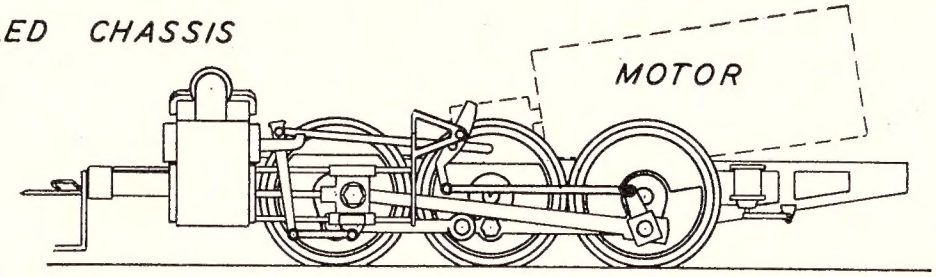
The valve gear parts are then fastened together with the tiny brass rivets. Put paper between the rods when you rivet

(*Continued on page* 50)

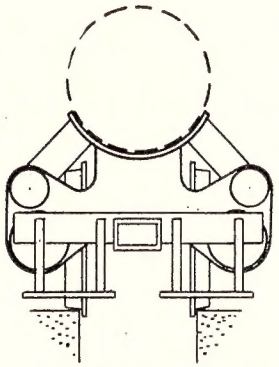
SOUTHERN PACIFIC 0-6-0 SWITCHER

DRAWING IS FULL SIZE
FOR HO GAUGE

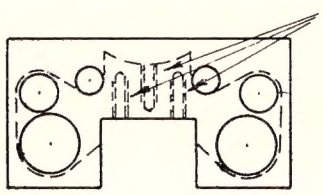
ASSEMBLED CHASSIS

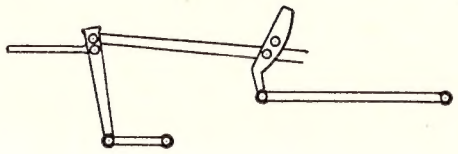


SIDE VIEW



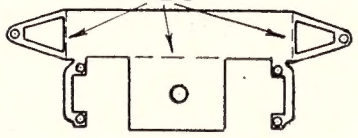
FRONT VIEW



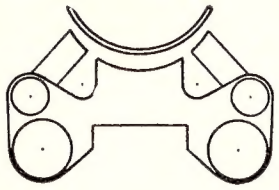


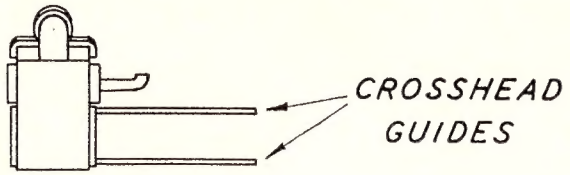
VALVE GEAR ASSEMBLY

BEND ON DOTTED LINES



VALVE GEAR HANGER

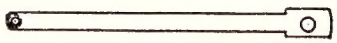




DETAIL OF CYLINDER BLOCK

AIR BRAKE CYLINDER

ECCENTRIC CRANK



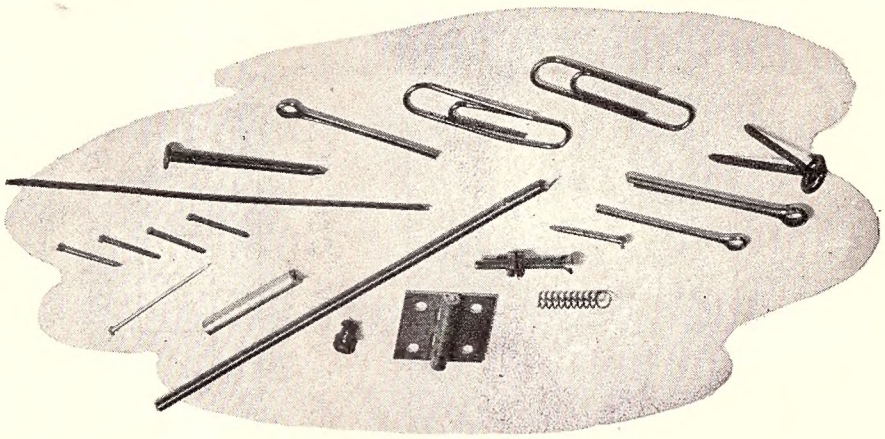
MAIN ROD

CROSSHEAD

L. AUSTIN

Trolley Pole Bases

PART II



Last month the construction of three other types of trolley pole bases was described — the U S 11, U S 20 and the Stearling Meaker. The simple materials on the right were used for the fabrication of all five types.

Ohio Brass Style Base

A newer, compact form of trolley base, the Ohio Brass units were almost universally adopted for modern light weight and streamlined cars. Although commonly seen with two springs, some assemblies used four and even six springs. Representative of the cars equipped with these bases, we find the new Pcc's, Brilliners, also the famous Indiana and Lake Erie lightweight speedsters.

The four spring type was chosen for the model illustrated, but obviously the base can be cut down to the double spring style without complication. The necessary materials are listed below:

1—screw 2-56 ¾" long
2—nuts 2-56
1—cotter pin $\frac{3}{32}$" diameter
1—No. 20 wire brad
2—No. 20 wire nails
1—Brass paper staple.

Fig. D-1 will show the first construction step. Thread two nuts on the screw and jam them tightly with flat sides parallel and so located that a ¼" lower extension of the screw is left to act as the base pivot. Solder the nuts fast, then drill through the No. 62 hole indicated at the joining surface. Now file the upper extension of the screw slightly flat on two sides, then drill a No. 62 hole through the screw at a point 3/64" above the top nut. Insert a No. 20 wire nail in this hole, cut to ¼" length, and soldered at the midpoint.

The trolley fork is prepared from the $\frac{3}{32}$" cotter pin in the manner previously described, noting however, that the fork is straight as specified in Fig. D-3. In regard to the upper spring holder, we take modelers license by using the pole itself as the foundation rather than to make a separate sleeve as in real practice. You will see in Fig. D-4 that this support is formed by wrapping a piece of the paper staple around the hole, squeezing it tight, then soldering it fast in an upright position. Locate this support ½" back from the hinge pin. Drill a No. 62 hole in the support 15/64" up from the pole, then cut away the surplus. Now solder a No. 20 nail in the hole at its midpoint.

Final assembly consists of riveting in a No. 20 brad as a hinge pin, then installing the springs. Here again the model photographed made use of four $\frac{3}{32}$" diameter brass springs, but $\frac{1}{16}$" diameter springs would improve the appearance. Cut four springs of sufficient length to hold the pole in nearly vertical position and bend loops at each end. The springs are soldered fast to the upper support but must swivel about the lower support. The nail head will contain the two springs on one side, so use the ball of wire trick, described for the US-20 base, on the other side, thus completing the base assembly.

Air Retriever Base

If you go for those big red cars and steeple cab locomotives on the Pacific Electric, the air retriever trolley bases will be a necessity since no other base will ever look quite right on these cars. Essentially these bases are single compression spring units of the folded over type to which has been added an air cylinder mechanism arranged to depress the pole whenever air is admitted. Two trick features can be provided by the cylinder unit, the first a dewirement trip made possible by an air valve that opens when a pole leaves the wire and rises above the maximum operating height. When the valve opens, the pole is brought down automatically, thus preventing damage to span wires. The second feature is provided by rigging up the operating valves of all poles in a train to push-buttons in the motorman's cab so that all poles can be automatically lowered when leaving overhead territory for third rail operation. Although these bases were used by a number of lines at one time, the Pacific Electric would seem to be the only principal user today. The bases are fundamentally adaptable to any car with compressed air on board, so if you have a free lance model that lacks roof top glamour, here is the cure.

The model illustrated is somewhat simplified but has the basic characteristics and a satisfactory likeness to the prototype cannot be denied. Construction takes a bit more doing than the bases previously described, but an evening's work will produce a pair. The materials needed are as follows:

1—screw 2-56 ¾" long
2—nuts 2-56
1—cotter pin $\frac{1}{16}$" diameter
2—cotter pins $\frac{3}{32}$" diameter
1—small sheet $\frac{1}{32}$" thick brass
1—piece tubing—⅛" OD—$\frac{1}{16}$" ID—$\frac{7}{16}$" long
1—common lath nail
2—No. 20 brads
2—straight pins
1—paper clip.

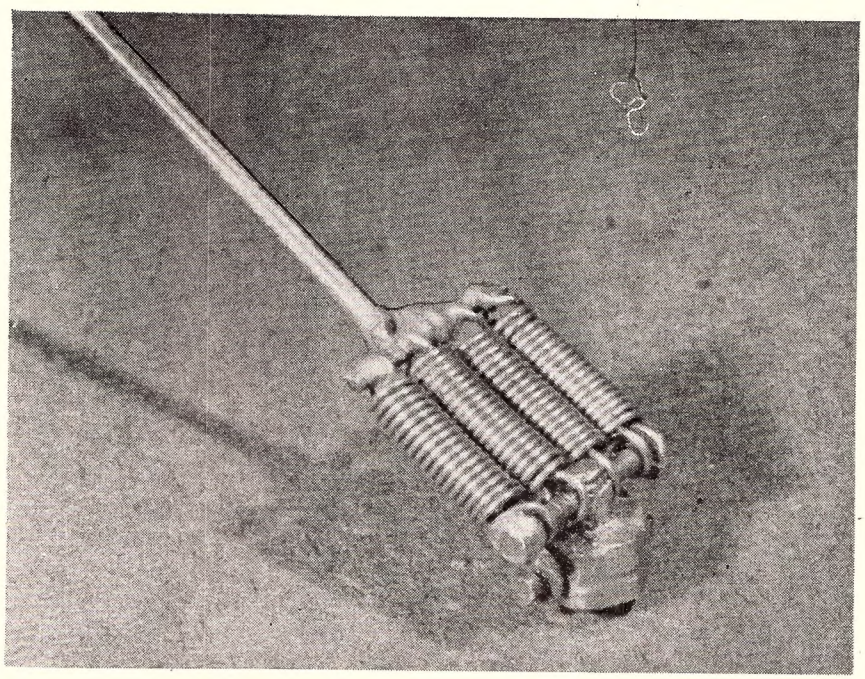
Once again the base pivot consists of nut and screw assembly, but with ramifications. Start by threading a nut up against the screw head. Now cut a $\frac{1}{16}$" slot in the second nut and jam it tightly against the first nut so that the flat surfaces are parallel, resulting in the assembly shown in Fig. E-1. Next turn up the ends of the $\frac{1}{16}$" cotter pin to the specifications of Fig. E-2, insert the upper leg in the nut slot and solder the three components together. Fig. E-10, cut away view, will show the relation of these parts. Since further soldering will be done on this unit that will loosen the cotter pin, bind the lower leg to the screw with a strand of fine wire for support. Now flatten the corners of the nuts, where the fork will attach, to $\frac{3}{16}$" width, then drill the No. 62 hinge pin hole indicated at the joining surface of the nuts. On the side opposite the cotterpin, file a $\frac{1}{32}$" wide groove down to the screw threads to receive the web plate as in Fig. E-4. The cylinder yoke is fashioned from a $\frac{3}{32}$" diameter cotterpin. Make a 60 degrees bend at the point where the loop begins, then part the two halves sufficiently to receive the web plate. Initially the web can be a rectangular plate since the outer edge can be trimmed to the cotter pin outline after installation. Now place the web in its slot against the screw and tack it with solder on the top side. Next position the yoke on the screw, noting from Fig. E-10 that the loop encompasses

the lower leg of the 1/16" cotter pin that is braced by the wire binding. The problem now is to solder the whole mass without letting any part slip loose. To this end, tap a 2-56 hole in a block of wood and thread in the assembly. Block up the yoke and web, then sweat the works together. If solder is used too freely, it will be necessary to scrape out the side channels between the lower nut and the yoke loop where the pull rods pass. As a final operation on this unit, bend out the yoke sides to the dimensions in Fig. E-3 and drill the No. 62 holes at the indicated height.

Fig. E-7 shows the air cylinder to be simply made from 1/8" OD tubing. Chuck a length of tubing in a drill press or hand drill clamped in a vise, and file a groove around the circumference approximately 3/32" wide and 1/64" deep. Then cut the tubing to 7/16" length with the groove at the midpoint. Wrap the inner loop of a paper clip around the groove and solder fast. Now bend down the clip ends to the tube centerline so as to form trunnions as indicated in the sketch. Drill out the tube ID to No. 49 size, spread the yoke to receive the cylinder, then squeeze back to shape.

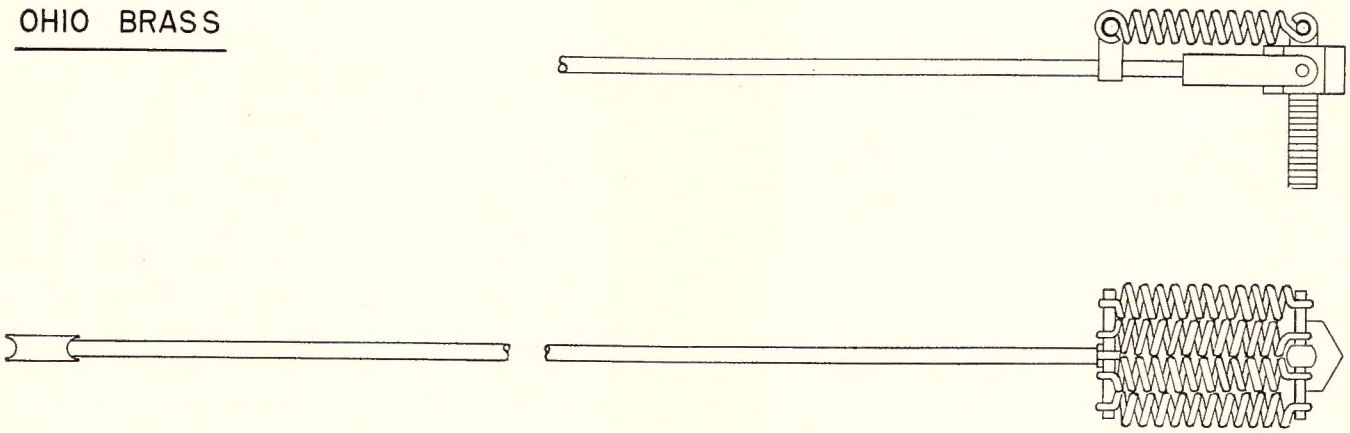
Fig. E-5 shows that the pole fork is formed from a 3/32" cotter pin in the man-

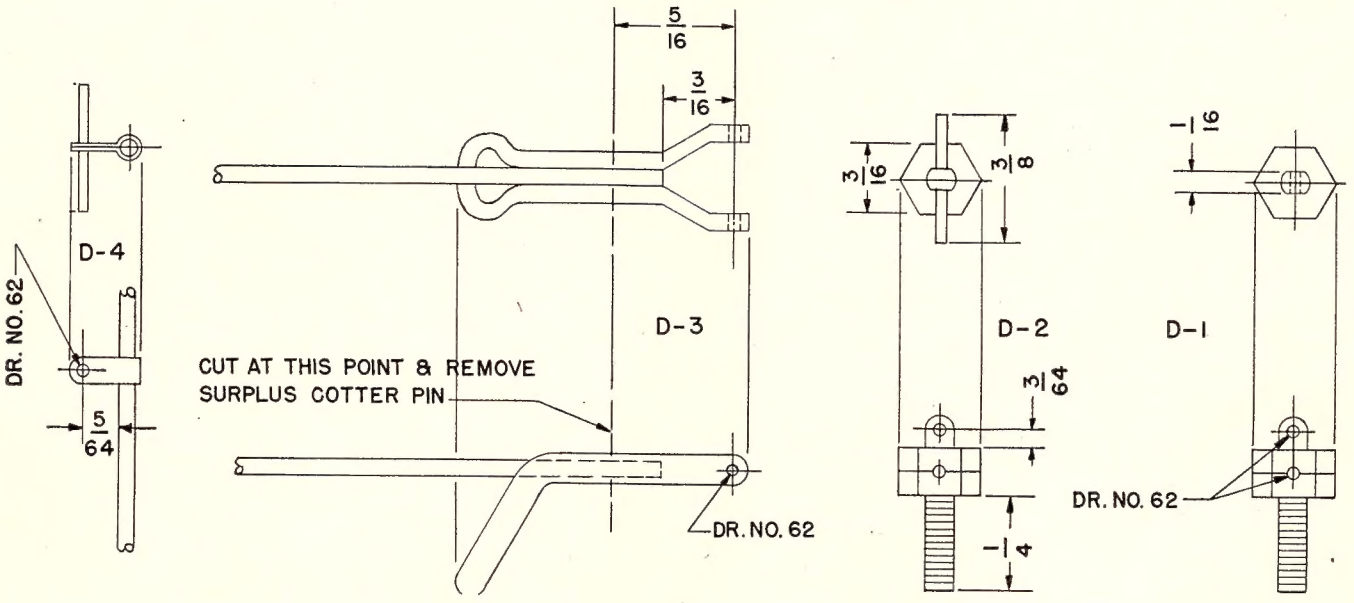
(*Text Continued on page 49*)

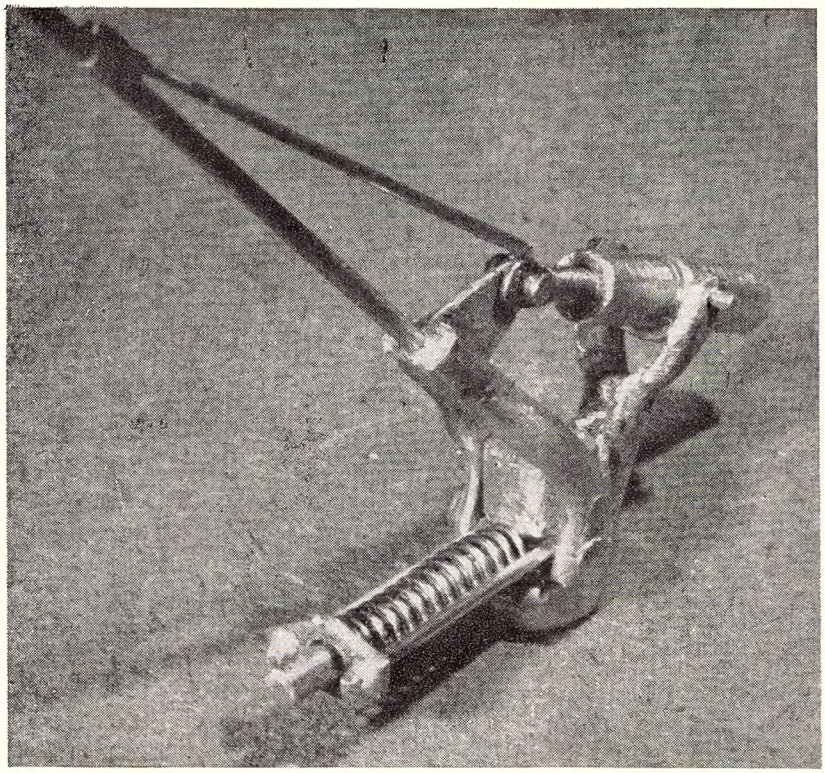


The Ohio Brass type base modeled in O gauge. Plans shown below approximately twice size for O gauge.

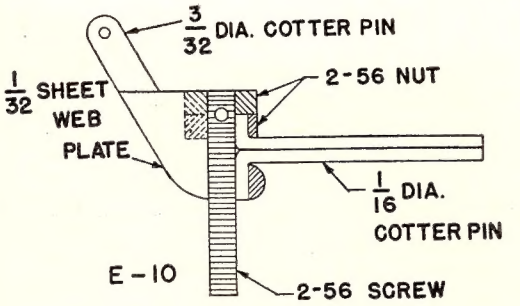
OHIO BRASS

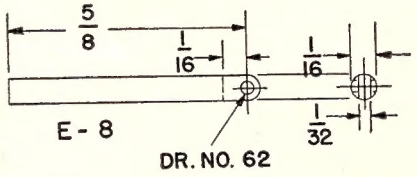


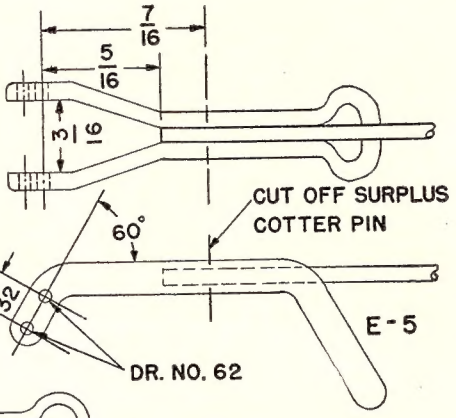


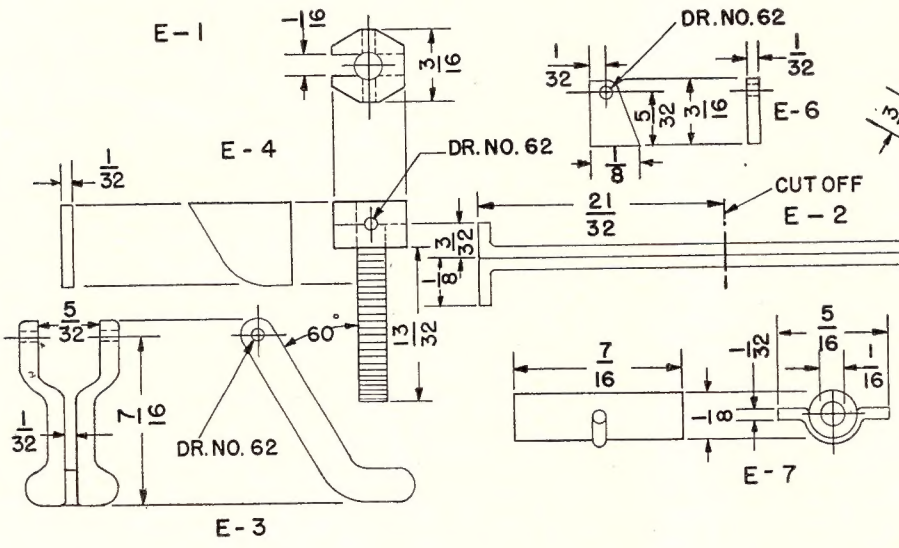


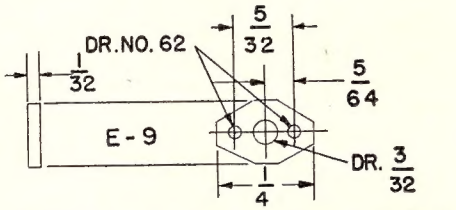
The Air Retriever type trolley pole base—model above in O gauge.

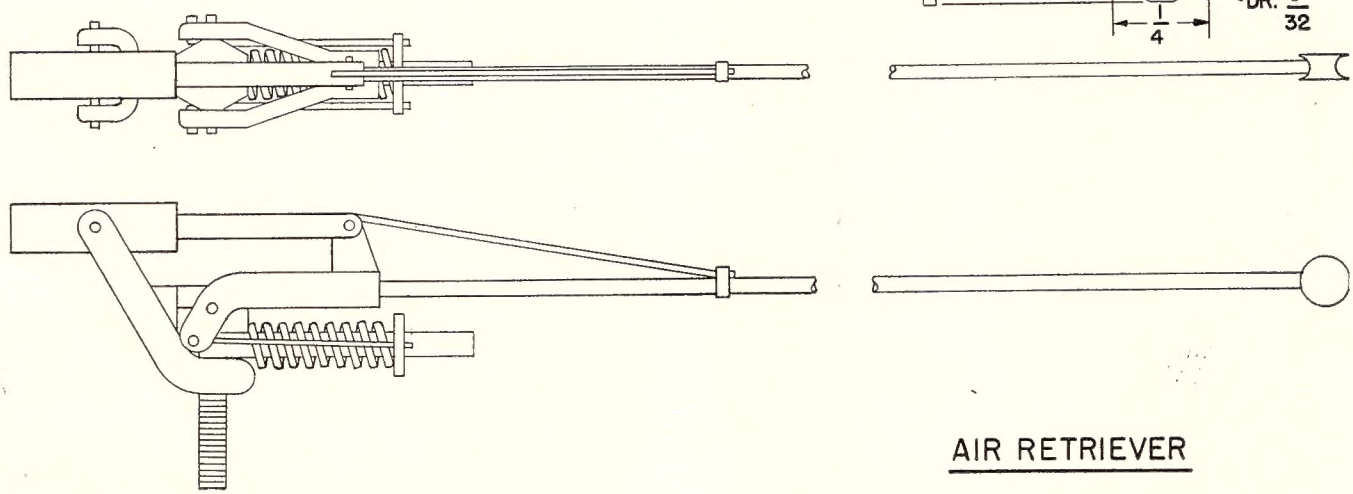




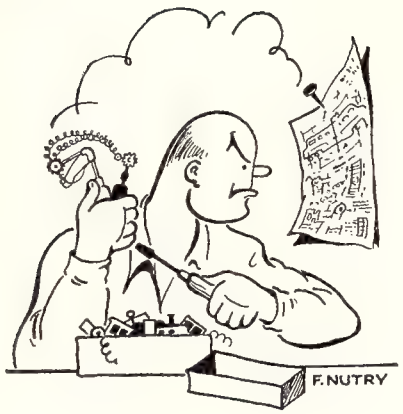








AIR RETRIEVER



Confessions

OF AN AMATEUR MODEL RAIL

By HARRY WATERBURY

IT has been my intention for some years to build a model railroad, but varying circumstances have operated to thwart any achievement until recently. About twelve years ago, a friend took me to an exhibition of the New York Society of Model Engineers, and my capitulation to the spell of Model Railroading was instantaneous and *utter!* I started reading the model magazines and dreaming beautiful dreams . . . there was a single-story building I had been projecting for my farm to be about 30 x 80 feet — and it was at once obvious that the building should have a loft, which could eventually be filled with scale model equipment.

Due to circumstances over which I had no control, the peach market to be precise, my plans were postponed. Remember back several years when you bought those lovely, lovely peaches for $1.00 per bushel? Well, I was one of the guys raising 'em and got only 35c per! That didn't even pay the spray bill, much less erect any new buildings. Well, as I was saying, due to circumstances, the long building was postponed from time to time, and finally abandoned. There was no electricity on my farm, the present REA line was then just being promoted so my plans had to be for future development. A couple of years after seeing the memorable exhibit of the N.Y.S. M.E, I went into business in a large midwestern city and promptly joined a model railroad club. In a couple of years of membership I learned almost nothing, and the club accomplished the same, so I quit attending and paying dues. About as far as I got with my ambitious plans was a name and four home-made cars. I also started a small engine after reading some of Eric LaNal's come-on stuff (How I Built a Scale American in Three Evenings, out of Spools, Shirt-boards and Tobacco Tins, at a Total Cost of $10.16). But my skill was unequal to cutting neat window openings in sheet brass; and after butchering up a couple of pieces I gave the locomotive parts to the club — that was before I quit! The cars I still have and they don't look too bad. I may work on them some time and see if they cannot be made to stay on a track. They certainly would not stay on the last time I tried.

Then came the war and I even quit dreaming models. Still later came the peace and retirement from business, disposal of the farm — and here I am, having spent the winter in New York about twenty minutes walk from a completely stocked model railroad store, and nothing much to do. I started collecting catalogues again, just to see what was being offered. The first thing I noticed were two gauges new to me, "S" and "TT". My own slight start was in HO, chosen to get the maximum mileage in a given space. So I hied me around to the store to look at this "TT", just in case — and decided to stick to HO. I am a pretty fair farm mechanic, but no watchmaker. Also, there was a much greater variety available in HO.

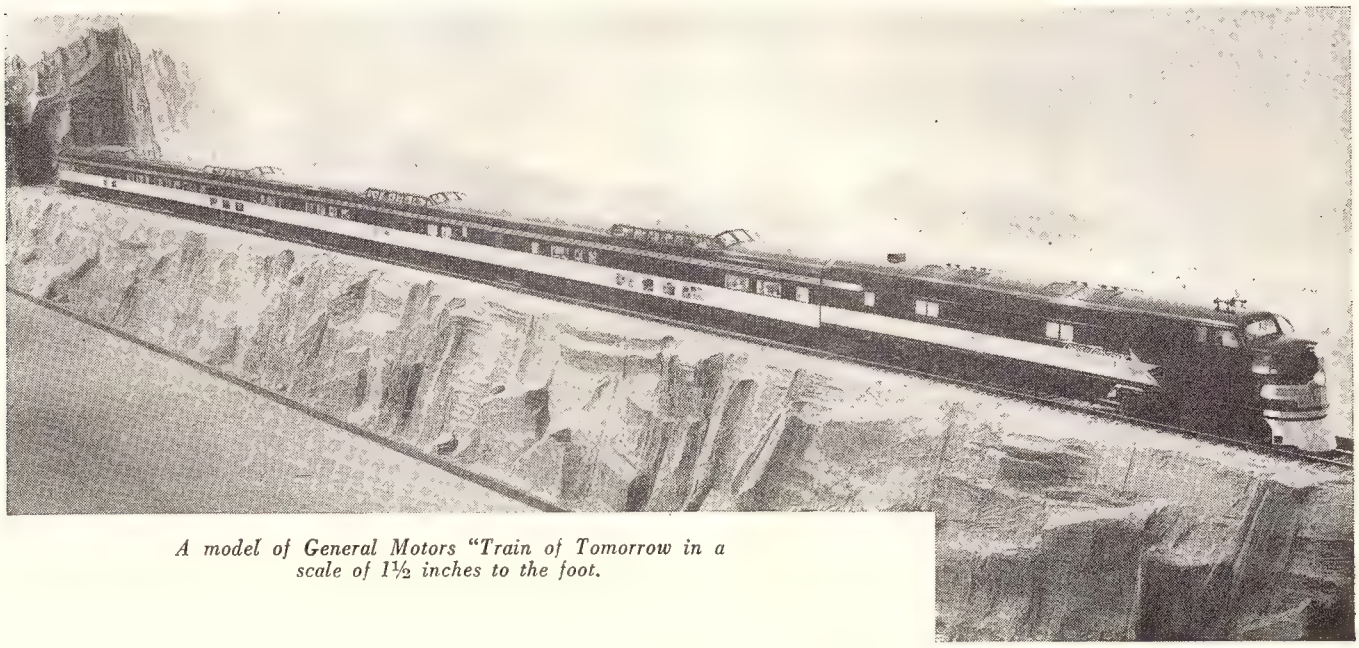
A New York apartment is no place to build and operate a model railroad, even if all the members of the family are of one mind on the subject. However, it is anticipated that this family will have a more spacious country property for a summer home and the prospects are excellent for an early beginning of the realization of some of my dreams. Being the ex-farmer member of the family, the task of hunting said summer place developed upon me, and I spent a very pleasant Autumn all over New England in a Jeep, farm hunting. It is likely that the family will agree on one of the various possibilities that were found. So it semeed good to me to do something more than to plan on the Highgate, Orford and Howes Railroad. After reading the magazines and catalogues over twice more, I decided on an 1880 style locomotive kit, (substituting a tall straight smoke stack for the bulging wood burner type that is standard), and proceeded to put it together in an "evening of child's-play." If I could have gotten my hands on the man who wrote that catalogue description, he would have eaten his words at the point of a large, heavy and razor-sharp carving knife. (I left the shotgun on the farm. They tell me they are illegal in New York.) I am a very patient man, but between the laconic printed instructions and the microfilm type illustrations accompanying same, after a few hours I had to descend to the street and kick a few small children into the muddy gutter to relieve the strain. According to the catalogue, a bright child or even a pretty dull adult, could assemble this engine in an evening, using common household tools. The devil he could! I did have sense enough to buy a jeweler's screwdriver along with the kit, and have been back since for some pretty special pliers. Several hours of effort have gone by and the locomotive is still far from complete, for the following reasons among others: 1) the engine cab is in two halves — brass stampings and the right and left halves were not mates, one apparently belonging to some other engine entirely: 2) missing parts — an important bolt and a crosshead guide bar were not in the kit: 3) instructions say at one point to be sure the wheels turn freely — well they don't apparently due to inaccurate quartering of drivers — what do I do now, papa? I have written the manufacturer, falsely assuming an urbane and friendly attitude, calling attention to the errors in the set and am awaiting his reply with great interest. Until then, no further progress can be made on the locomotive.

So, why not make up some coaches while waiting on the locomotive? Here are some that look fine in the advertisements — all metal, no soldering. (I *can* solder — I *like* to solder — but both irons are in storage waiting on a summer place to ship them to). These will match the engine — open platforms, brace rods, four wheel trucks, stove pipe. "Go together in no time flat!" "All parts readymade and have only to be fastened together!" Brother, are you one #%&c liar! These cars had several places to be riveted, using a cast lug on a die-casting for rivet. I have riveted a good many mower sections, quite a few harness repairs and innumerable aluminum pot-handles with successful results. But, where in Heaven's name in an ordinary household will you find anything suitable for anvil and hammer in HO size? The anvil part is the catch, also the need for five or six more hands to hold everything together while the ordinary left hand holds a riveting tool (nail set in this case) and the regular right hand holds the hammer. At that I got all but one of the things in. The one I didn't, of course, just messed up the whole end of a car. I am writing to the manufacturer asking for another die-casting to replace the one I beat up without getting riveted, also for three brace rod brackets that I chewed up trying to get enough tension on the brace rod to take the sag out of it, also for two platform handrails, omitted from one of the sets, although included in the list of parts.

Well, that brings me up to date. I spent the afternoon painting. The cars will be Pennsy red, with coach green window trim, letter boards and railings and gold lettering with a slick varnish finish. And I wish I had bought the slow-drying paint they tried to sell me at the store instead of the quick-dry that I insisted on having. A slow worker has difficulty getting the quick-dry on evenly.

You might think that my enthusiasm would be considerably dampened by these vicissitudes. I am hardly willing yet to

(*Continued on page* 49)



A model of General Motors "Train of Tomorrow in a scale of 1½ inches to the foot.

Train of Tomorrow

By WALTER A. MUSCIANO

ONE of the truly great strides in railroad designing has been made by the Electro-Motive Division of the General Motors Corporation in their "Train of Tomorrow." This complete train has toured the country and has been exhibited in the major cities. The widely publicized Astra-Dome was the central idea for the train and was developed along with numerous other innovations into a classic example of what the future holds for railroad passenger accommodations. In view of the fact that General Motors builds only locomotives and has no desire to build passenger coaches, the Pullman-Standard Car Manufacturing Company undertook this phase of construction using the General Motors design.

Mr. C. R. Osborne, vice-president of General Motors, conceived the idea of the Astra-Dome in 1944 while riding in the cab of a freight train crossing the Colorado Rockies. He was so fascinated by the glorious view that he spent that night making sketches of a car that would give the passengers an elevated position in order to view the surrounding country side. Upon consultation with train designers, a train utilizing the latest developments of the industry was conceived. A model of the train was built to the scale of 1-½" =1' (see photo) and when more than 350 of the highest ranking officials of 55 class 1 American railroads saw it they were so enthused they suggested that the full size train be built. Late in 1945 General Motors decided to undertake the building and try out of the train as a development project for the railroads.

Model rails can use the plans and photos to reproduce this ultra modern train for their layout. In view of the fact that the train is run on all the railroads as an experiment, the model will feel at home on any scale arrangement and can always be looked upon as having set the pattern for future post war railroad travel.

The length of the train is 411 feet including one locomotive (two locomotive's can be used for long sections) and passenger capacity is 216. There are four (4) cars in addition to the engine: A kitchen and dining car, a chair car, a sleeping car and a lounge-observation car. The exterior is finished in Blue and silver

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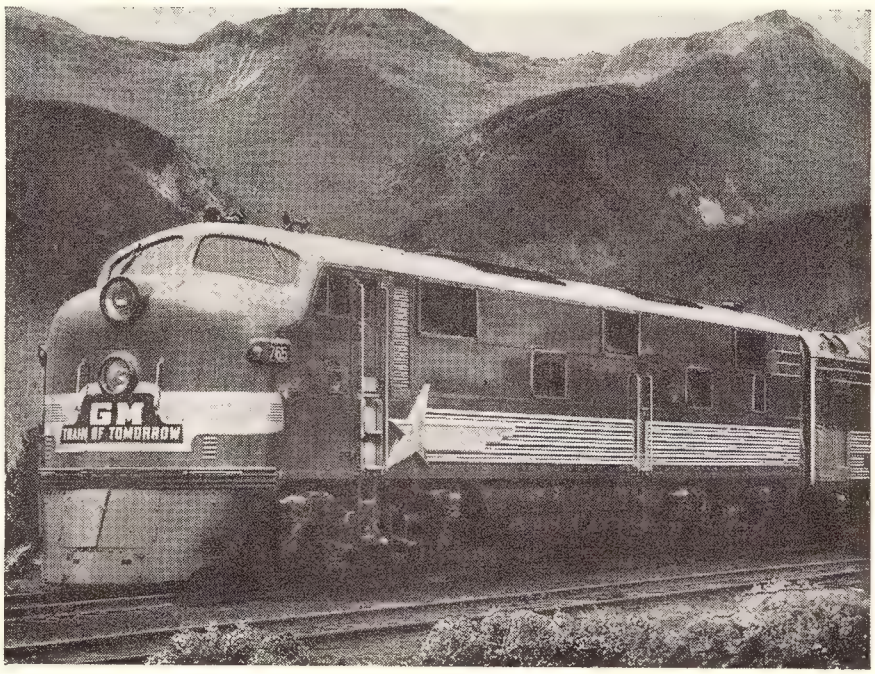


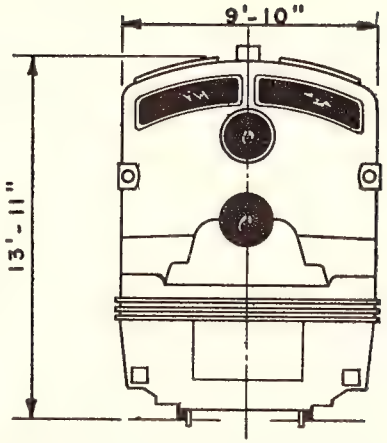
The head end of the Train of Tomorrow—the actual prototype. The mountainous country in the background should be very easy to model.

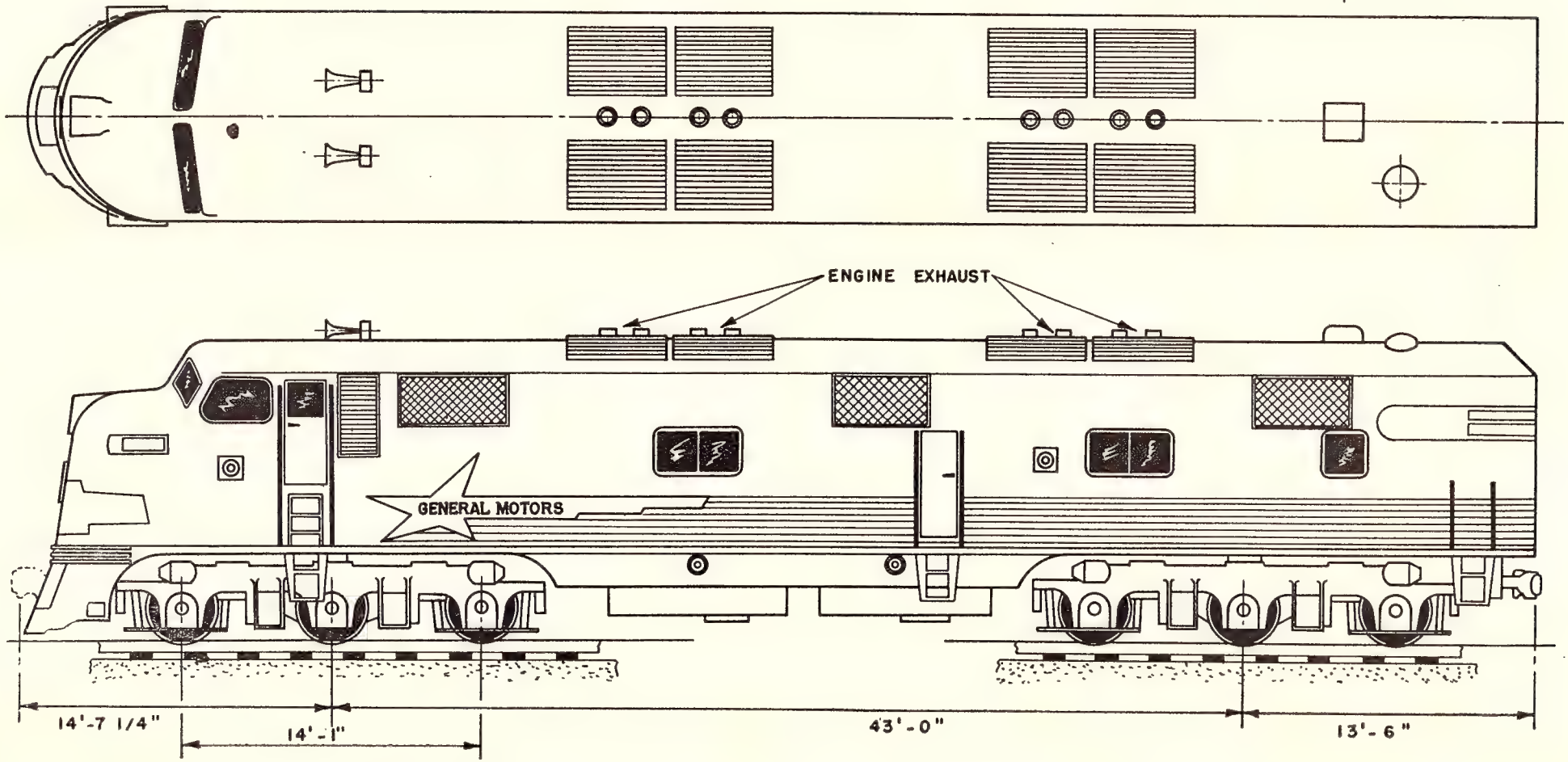
G.M. TRAIN OF TOMORROW —— LOCOMOTIVE

SCALE — HO GAUGE

3.5 MM = 1 FOOT

DRAWN BY— W. MUSCIANO





Free Lance Diesel Switcher

By RAYMOND E. STAPLES

THIS model is truly free lance and is patterned somewhat after the thirty-ton Diesel switcher built by the Whitcomb Locomotive Company, a subsidiary of Baldwin. This model has received considerable comment and would be an interesting addition to any pike. This HO model was built around the Varney power unit. No motor tools are necessary for the construction, although a Handee Grinder was used to drill the two holes necessary for the headlight and pickup hanger.

Construction of this model started with shim brass acquired from a local auto shop. Mark out a square 1⅛" x 2 5/16" on #20 sheet brass. (Figure A.) On each end, add ⅜" and scribe a line across and an additional space at each end of 3/16" for the steps. You can now bend the steps into position, or if you prefer, first cut out the deck for the motor and pulley drive. Take the motor unit apart and cut out the center of this first sheet of brass just enough to allow the motor to fit snug against the worm and gear housing. This deck will, or should, act only as a spacer washer would and therefore should not change the tension of spring drive or position of motor on housing. When the steps are bent over and the deck is cut out, take two pieces of HO rail, cut them to length and solder them to underside of the deck, at extreme sides. (Figure B).

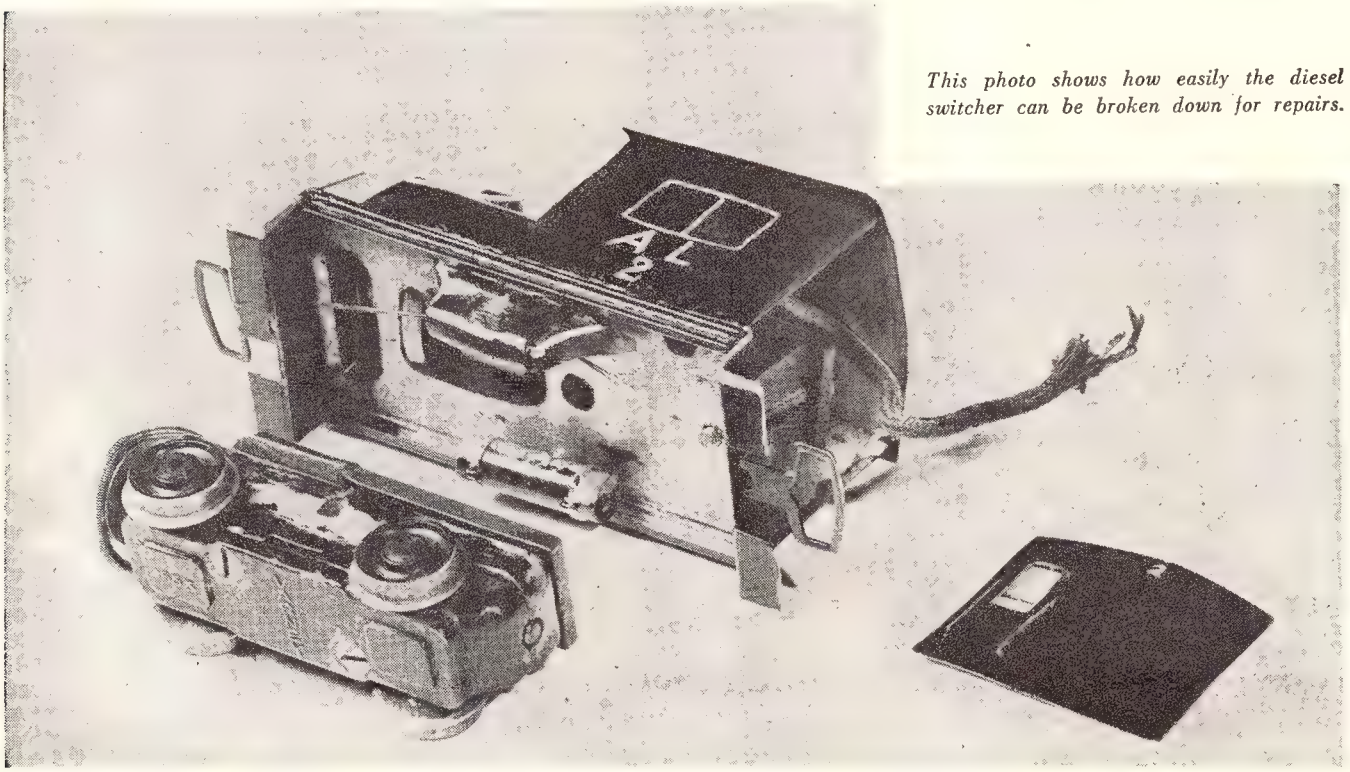
For the hood, take a piece of brass stock of about a #28 gauge and 1" deep—the length will be determined by how it is bent over the front of motor and pulley (the curvature). It should be soldered to the main deck and clear motor by about an eighth inch. (Figure C1) The motor hood may be made slightly square instead of rounded.

Again using #28 gauge stock, cut two pieces 1⅛" square. Take one piece and lay on the deck (endwise) against the hood and scribe a line denoting the shape of hood. This center oval or square can be cut out and filed smooth. When fitted to deck and hood, it should fit snugly *on* hood and touch the deck. Now lay on a solid surface (other than on the "Brass Hat's" best mahogany table) or place on a piece of lead and punch or cut out a window on each side of the hood oval. (Figure C1) The center line of window should be lined up with the top of hood. Windows can be 3/32" x ¼". After finishing these few small jobs you can now solder on hood and deck, 1 3/16" from the rear of deck piece. Before soldering, round off top for roof. I did it the hard way on my model by cutting off the top after.

The back of cab (the other 1⅛" square piece) has a window on the left side (3/16" x 5/16") and the upper part should be rounded the same as the front section. (Figure C2) The window is ½" from bottom and ⅛" from side. For some added detail, scribe heavily on reverse side under window to simulate a door having the window as an integral part of door.

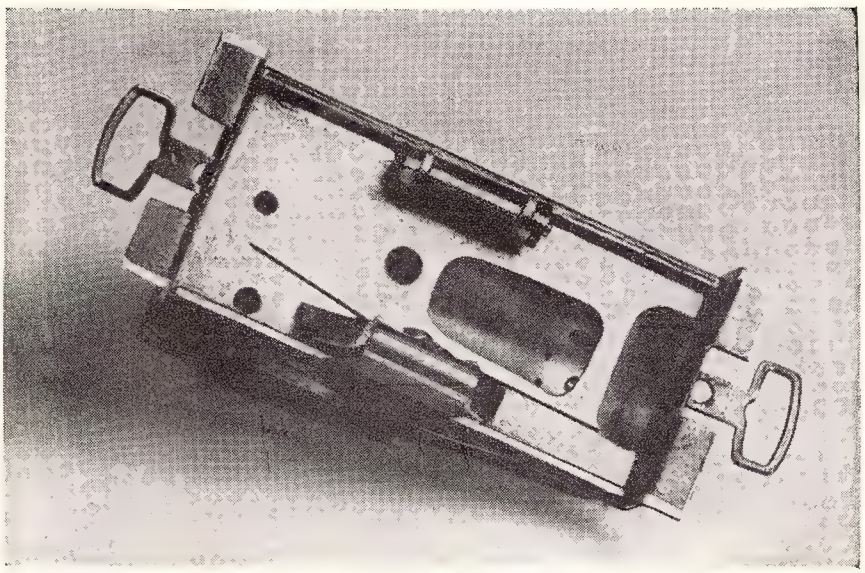
Cut two pieces 1 3/16" long x 1" high out of #28 gauge brass stock for the cab sides. (Figure D) From these pieces, measure and scribe a light line 7/16" from the bottom and cut out a window ½" x 5/16" in the center of side. Again for some detail to dress up this model, on one side scribe lines lightly where you can punch small indentations to simulate rivets on the face side. I've used a dentist's drill with the small burr knocked off. The face side should now have a neat row of rivet heads. A little patience and practice will enable you to get the proper depth. After completing this rivet detail you will find that the stock has curled up somewhat—but don't worry—lay it on a piece of wood or lead curved side down and with a piece of lead on the side, tap with a small hammer and presto—flat again.

The windows are fairly large and if you prefer, a wire or thin piece of brass



This photo shows how easily the diesel switcher can be broken down for repairs.

Bottom view of the diesel switcher showing how the "Floor" was cut to accept motor.



can be soldered to the inside of window (centered) and you have two frames of windows. (Figure D) By soldering sides to deck and front cab piece, you now have something to show for your past labor.

The roof piece is plain and is $1\frac{5}{16}$" square. Bend gently until it forms a small curve and center on the car and solder fast.

The rear of cab does not have to be soldered for by making it a snug fit, it can be easily removed thus making motor repairs and changes a simple operation.

Dig up an old ruler with a brass edge, remove it (when the Mrs. isn't looking) and cut it to the length you need. This will serve for the edge of radiator. Solder fast to the hood at extreme front end. (Figure E) If you don't have a ruler, any brass strip $\frac{1}{8}$" wide will do.

If you haven't any fine mesh wire in your excess box it can be obtained from the local hobby shop (grille maring parts). This can be glued (if fibre) or soldered (if wire) to a piece of brass sheet stock which you make for the face of radiator. Place this piece of sheet against the hood and deck and scribe a line on flat stock to the shape of *your* hood. The hood on my model is oval—yours may be a bit more squared. (Figure F) Cut this out and cut a $\frac{3}{8}$" x $\frac{9}{16}$" slot for your grille work or radiator. When this piece is soldered, make certain it is not on inside of hood as it may not clear pulley. Remember that the clearances on this model are very slight.

Mantua couplers (loop only) are cut down (shank) and soldered to the foot board at correct height from rails. (Figure E) A hollow rivet $\frac{5}{16}$" long x $\frac{1}{8}$" diameter with the head ground off is used for an exhaust stack. To be a bit different, I placed mine directly in front of the cab. This stack is soldered fast.

As originally made, the bell on my model was turned down from a piece of brass rod. The rod was inserted in a "Handee" grinder and a file was used for cutting. This has since been replaced with

(*Continued on page* 45)

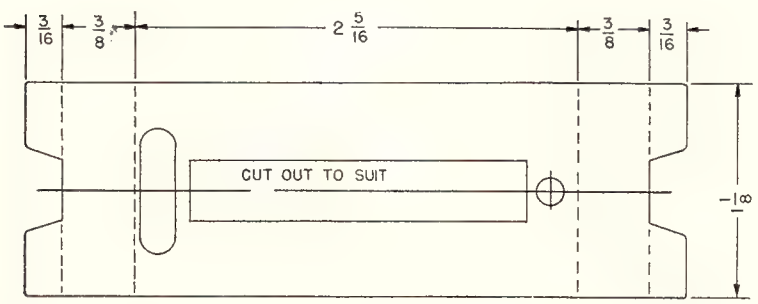


FIG. A

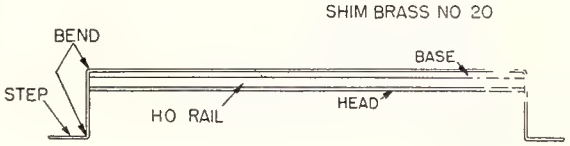


FIG. B

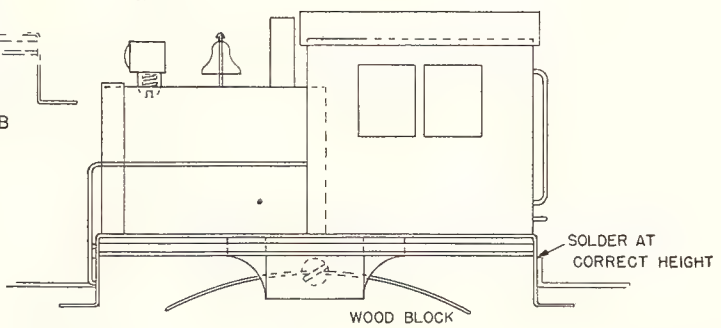


FIG. E

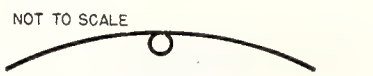


FIG. G

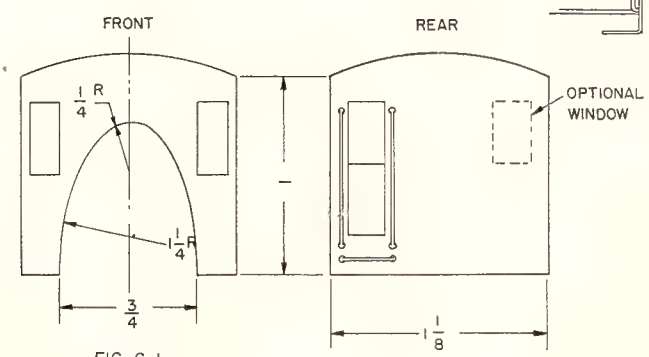


FIG. C-1

FIG C-2

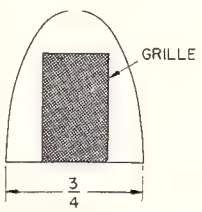


FIG F

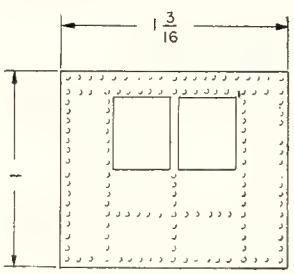


FIG. D SIDE
(WITH RIVET DET.)

Design of Tomorrow—or the day after! Suburban combination switch tower and passenger station built in HO gauge by Tom Duskinka of Rutherford, N. J. The Switch tower contains dispatchers desk and chair, track control board upstairs with relay boxes downstairs. The Passenger part contains three benches, ash trays, ladies and gents room, ticket and baggage offices. Typical construction was used—cardboard, balsa and celluloid.

YOUR NABOR'S PIKE

WANT THREE BUCKS?

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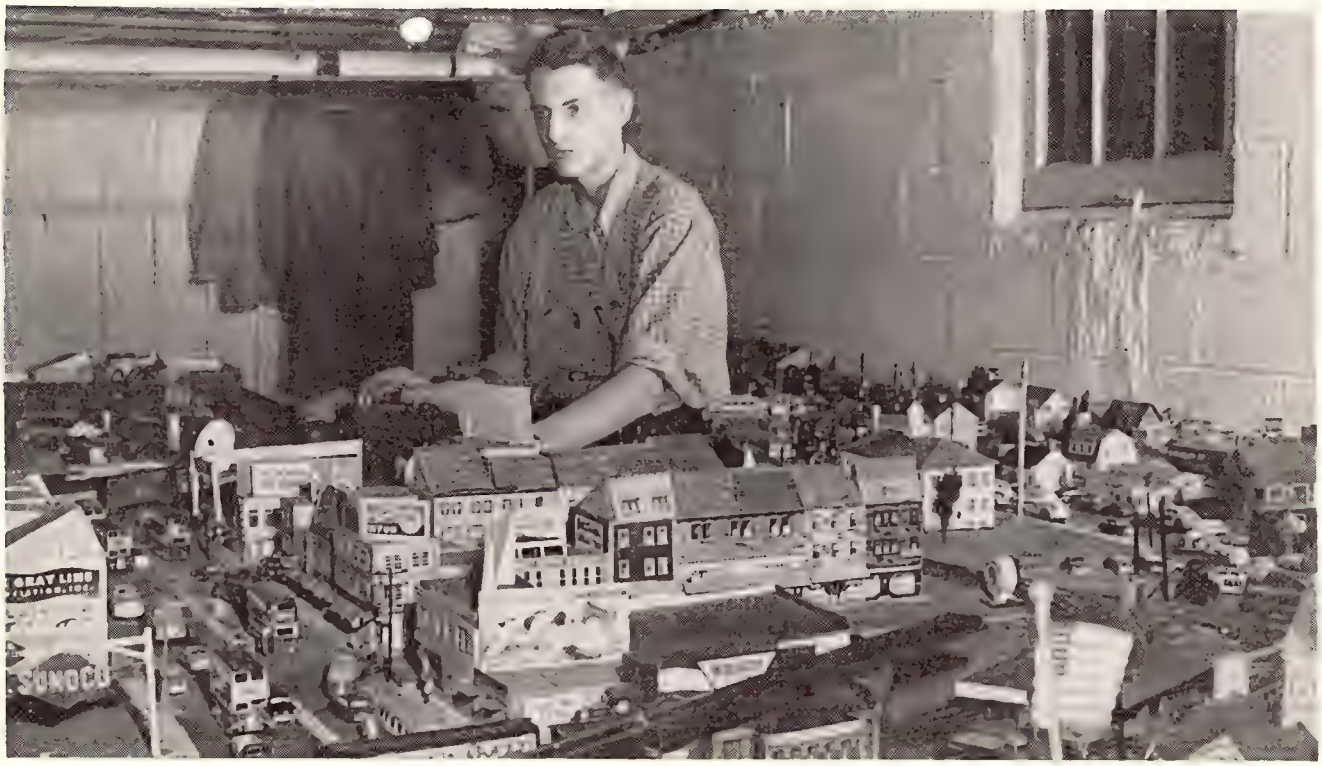
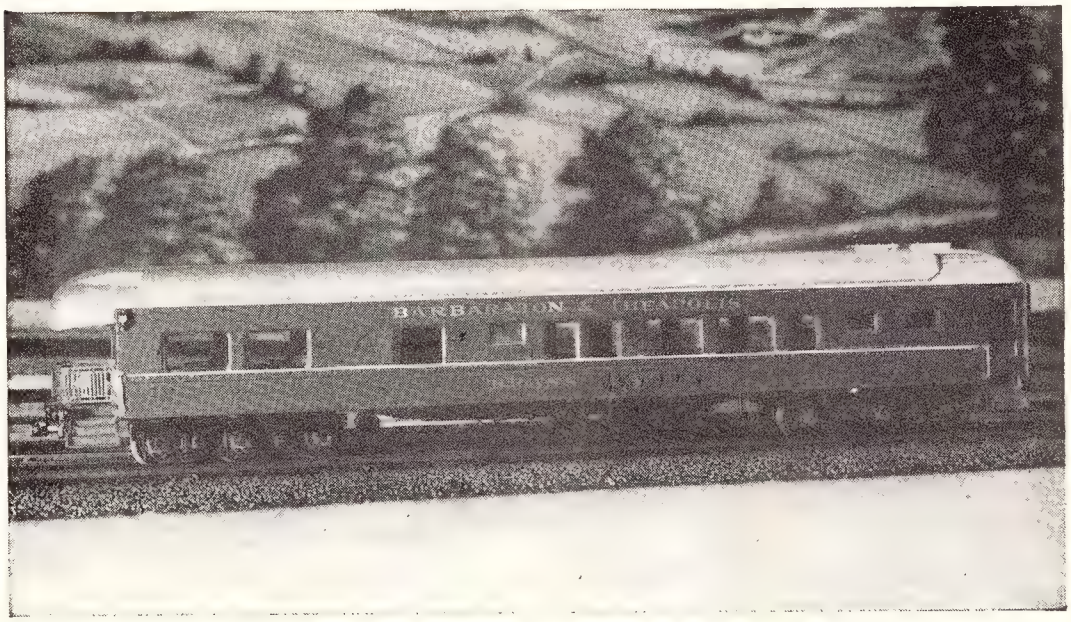
A line up of trolley equipment on the Pawtucket & Northern Railroad of Frank Bergeron, Pawtucket, R. I. This outfit is O gauge and third rail—all equipment including the car barn is home made.



J. P. Hoschek of Trenton, N. J., in the midst of his elaborate HO model railroad. As you will note, this builder goes in heavily for scenic effect—note the busy city streets complete with double-decker buses.

Two narrow gauge rail bases built by Vincent Ryan and Jack Alexander. These two buses are making a meet at "Helper" on the narrow gauge lines of Jack Alexander.

This is C. L. Marstons Western Pacific #27 tenwheeler, posed in the servicing shop maintained on the O gauge road of that name at Columbia Falls, where the Idaho Division and the Oregon Division join. This maintenance shop is modeled after the Southern Pacific facilities at Fresno, Calif.



The Dining-Lounge Observation Car in OO gauge as built by the author. The rolling countryside in the background is on the main line of the B & T Railroad.

A Dining-Lounge Observation Car

By H. R. TREAT

IN the passenger car catagory, one of the most fascinating cars to build is the open-end observation. This is undoubtedly so because it offers such unusual opportunities for freelancing-type of roof, window arrangements, underbody facilities and general detail being entirely a function of the builder's imagination.

While the use of these cars for general service is restricted on prototype railroads, many can still be seen in coach yards and station sidings awaiting their consignment as private and business cars. When the big shot and his entourage are ready to board for destinations near and far, this car will tail-end any consist from a lone combo to a long string of varnish. So it goes, even more so, in the miniature field where the brass hat can really shuttle his cars around. In addition, the observation has a way of completing a passenger train and saying. "This is it," the same as a crummy does to a freight drag.

Having a yen for the unusual, I resurrected this car due to its varied history. Seems like it was built as a business observation for the mogul of a Class A road. Its range was confined only by the two oceans and it could always be seen where the hunting, fishing and empire building were most urgent. Through circumstances it passed into the hands of some circus tycoons who travelled the country in the luxury of this palace on wheels. Bad times and receivership came upon the circus, the banks stepped in, and the car was sold to the highest bidder, who happened to be the enterprising Barbaraton & Theapolis R.R. This time, the interior was remodeled as a diner-lounge-observation to tail-end a new crack daylight train connecting Barbaraton and Theapolis with the Hinderlands. The results of this refitting are as shown on the accompanying floor plan.

The construction of the car is of wood and bristol board, a method used by many model builders for its exceptional building ease and fine detail. I hope in going through the construction routine to pass on maybe a new thought or two in the know-how or a method that can turn out cars as fine as those custom jobs of Joseph J. Fischer.

The sides are built up from 2-ply bristol board, preferably Strathmore board, as shown on the elevations. Each side consists of superimposed strips in the order named: sash strip, window strip, letterboard and side sill plate, and lastly the belt rail. The sides are projected on a sufficiently large sheet of bristol board with a 4-H pencil, the opposite side being upside down in order to line up windows where they oppose each other. For those in "OO" the strips can be projected directly from the drawings. For other gauges, the overall dimensions are shown and smaller detail can be easily scaled at 4mm. equals 1'-0".

The sheet of bristol board is next cut out and I recommend using Xacto's No. 6 knife (the heavy one) with a No. 24 blade. My procedure for fine cutting results is as follows:

(1) Use a zinc plate for backing up each cut.

(2) Make two or three strokes with the knife for each cut.

(3) Hone the knife blade frequently on a carborundum stone.

(4) Use a metal straight edge—plastic, wood and celluloid trimmed T-squares are too light and their edges have a way of becoming badly sliced and nicked.

Next step is to put on the rivets. Some do this the hard, tedious way for exact scale results, but I use a paperhanger's perforated cutting wheel, obtainable at any wall paper supply house for less than a dollar (this gadget is also very useful for trimming wall paper). The riveting is done on the letter boards, side sill plates and between the openings on the window strips. The perforating wheel is run along a straight edge on the back of the strips at just the right pressure for forming the rivet heads on the face sides. A little practice will result in very good rivet heads—not scale size or spacing, but very impressive. After all what we want is to attract the eye and for impressive rivet detail we have to exaggerate, particularly in the smaller gauges. Also, the perforating wheel against a metal straight edge produces a lot of rivets in a very short time.

The sash and window strips are cemented together, the excess cement squeezed out with a roller and immediately trimmed away. Next apply the letterboard, side sill plate and belt rail. Immediately after finishing the cementing, place the sides between two straight pieces of wood with a heavy weight on top—I use a 13½ pound anvil. This weight incidently, will level out and slightly flatten the rivets to better proportions. Leave the sides under the weight until after lunch, or the next day if its that late, and continue the same way with the doors and ends.

Apply a coat of shellac all around, sand down, and then add one base coat of paint smoothed off with OO or OOO steel wool. PAINT THIN for all coats.

The base coat of shellac is particularly effective as a sealer. filler and strengthener for the bristol board.

To complete the sides, cement a frame of bristol board to the backs around all openings but keep about one-eighth inch away from the openings. Cut out acetate windows to fit loosely in these frames. Hold in place by 2-ply strips extending over the acetate and cement to the frame. If you prefer, a complete side matching the window strip can be used. To prevent disaster, avoid using excessive cement, due to the tendency of the transparencies to creep. Cementing the acetate directly to the sides has resulted in many a buckle at the window mullions. One car that I had carefully built for contest purposes was wrecked by a bulge in the side because I was over-generous with the cement, even though I was careful to frame the windows.

The sides are now laid away where you can gloat over your handiwork while the framework, or body, is prepared. Note that, excluding the belt rail, the sides are a total of 10-ply thick.

The framework consists of floor, roof and intermediate vertical supports. The drawings should completely tell the story. The floor is of one-eighth inch white pine, —material up to one-quarter inch thick can be used. The roof can be either monitor or arch type. Airconditioning strips have been added to the monitor roof of my car. Two hatches were also added over the kitchen portion. Although I didn't put them on this model, the drip strips shown on the drawings are a nice touch of refinement. Bamboo splits make excellent drip strips. Add as many intermediates as possible of at least one-quarter inch white pine. Cement them to the roof and floor, square-up the entire frame, and reinforce with bank pins—cut off the heads and drive flush with the wood.

Add the underbody detail next. The center sill is shaped of wood cemented and pinned to the floor. A riveted plate is cemented over the sill to represent the prototype practice of using a box girder made up of channels and cover plate. The bolsters are wood or metal strips. Drill holes exactly vertical for the king pins. A variety of tanks and boxes are needed to suit the service conditions involved. Shown on the plan of the underbody is my conception of details needed. Purchased small castings are triple valve, brake cylinder and generator. The steam traps are made from finishing nails with the heads flattened and ground to shape. The floor is rabbeted at the coach end and completely cut out at the observation end for receiving the steps, which are cemented and pinned in place.

The coach end can either be formed from wood with a riveted bristol board overlay or purchased as a casting. The same also applies to the diaphram. I make diaphrams from one-eighth inch square wood strips cemented together to form a rectangular box. The top is slightly rounded and top and sides are grooved with a V-file. The diaphram face plate is cut from bristol board to shape shown on the coach end elevation.

For private cars the vestibule can be closed by cementing the end door behind the coach end. Otherwise, for open vestibules, cement the door to the inside partition. The side doors are set in place and reinforced at their edges by wood strips.

The observation end wall is built up the same as described for the car sides. Rabbet or groove the floor and roof sections and fit in place. See Section A-A of the drawings. Attach the end sill, and apply a bristol board floor over the entire platform. The end sill can be formed of wood (I prefer hard wood), or be a casting. The awning is cut from bristol board and cemented to the roof. A striped design on the awning adds a nice dash of color.

At this stage it's a good idea to attach the couplers and trucks with screws and adjust with washers, as needed, to operating conditions.

Prime paint all exterior and interior surfaces, except where the car sides are to be cemented to the framework. If the interior is unfinished, one coat of dull black is sufficient, bringing us to a good place to talk about interior detail.

Probably the least conspicuous, but most commented upon of detail is interior furnishings. People will insist upon practically rubbing their noses on the car, expecting not to see anything inside. When they do, of course, it is a great discovery even though just a suggestion of interior detail is involved.

The large windows and different sections of this car are particularly expedient for interior detailing. Tables in the dining section and lounge chairs in the rear section are simple to make and install.

The floor plan shows complete seating arrangements for the two sections, following prototype practice. The tables are blocks of wood 2'-6" wide x 3'-6" long x same height as window sill. To simplify the work, the chairs are best installed to indicate the seats pushed under the tables leaving only the backs to detail. Cut them from tin, 18 scale inches wide, and slightly curved. The top of the chair backs are a scale nine inches above the table tops.

The lounge chairs are made of balsa wood. Their overall measurements are 2'-6" wide x 2'-6" deep x 9" above window sills. Notice that all heights are taken in respect to the window sill to compensate for floor thickness, which generally exceeds that of the prototype. Assembly of the chairs is indicated by the floor plan and Section A-A of the drawings.

Paint the tables white (to represent the linen) and the chairs grey, green, or your choice of colors. You are the interior decorator. Also paint the walls, ceiling and floor of the dining and lounge sections in pastels to reflect as much light as possible. I recommend Testors Dope for quick action, although any enamel, toned with white, is good.

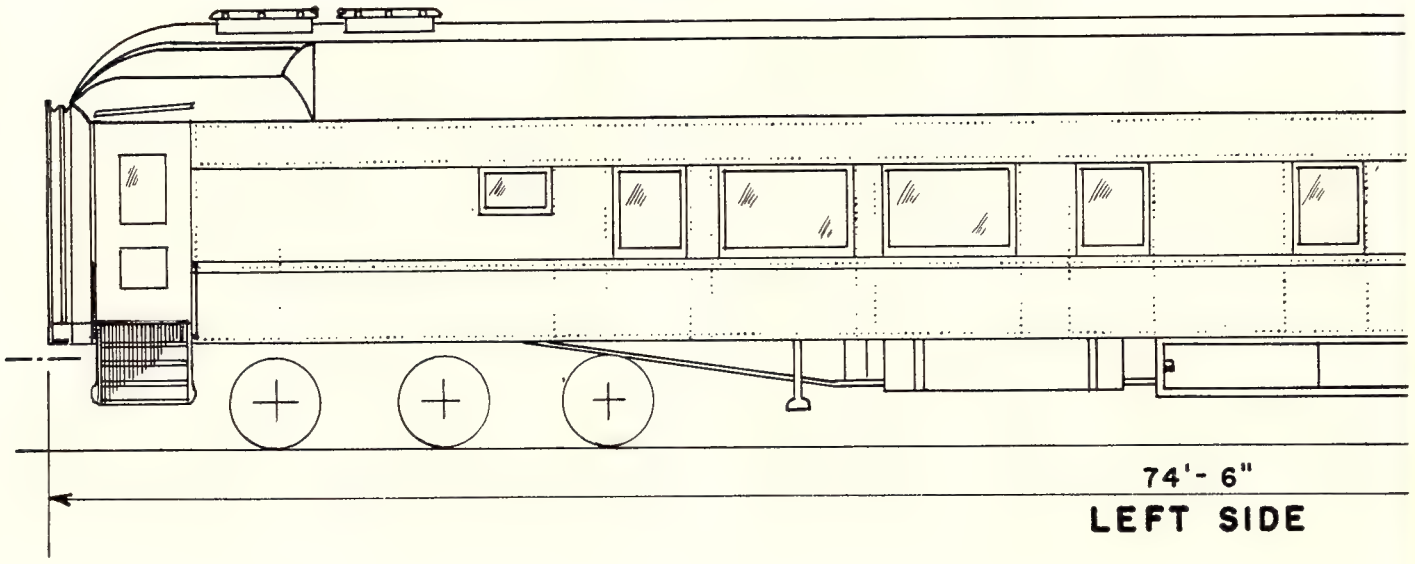
Fix the furniture to the floor with a small amount of cement and a pin with head cut off. Note the partition to the left of the dining section on the floor plan. This partition is of bristol board with an arched doorway in the center. Attach to car by sliding in grooves between the roof and floor, as shown at the roof in Section A-A.

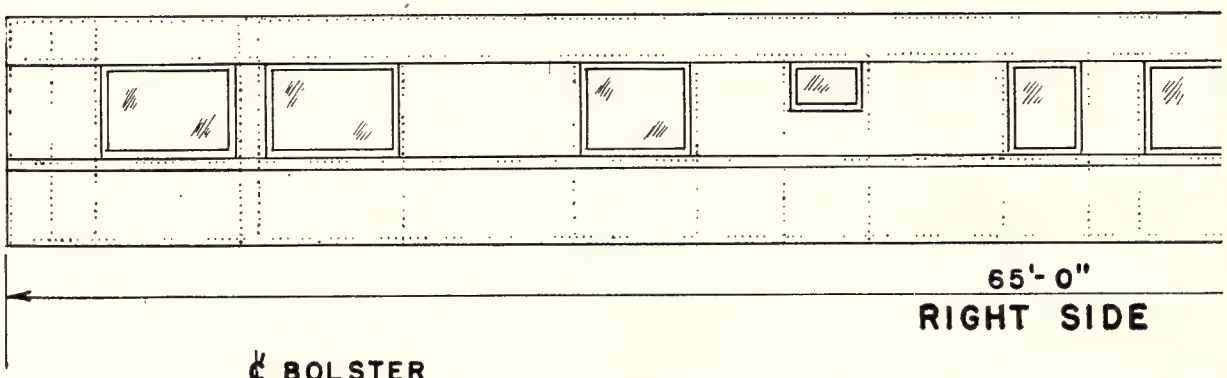
Thin partition walls are shown for the kitchen, smoking and powder rooms, but they can be left out and these sections painted a dull black. Note the ¼" thick wood construction supports, shown hatched on the floor plan. which also act as partitions between the various rooms.

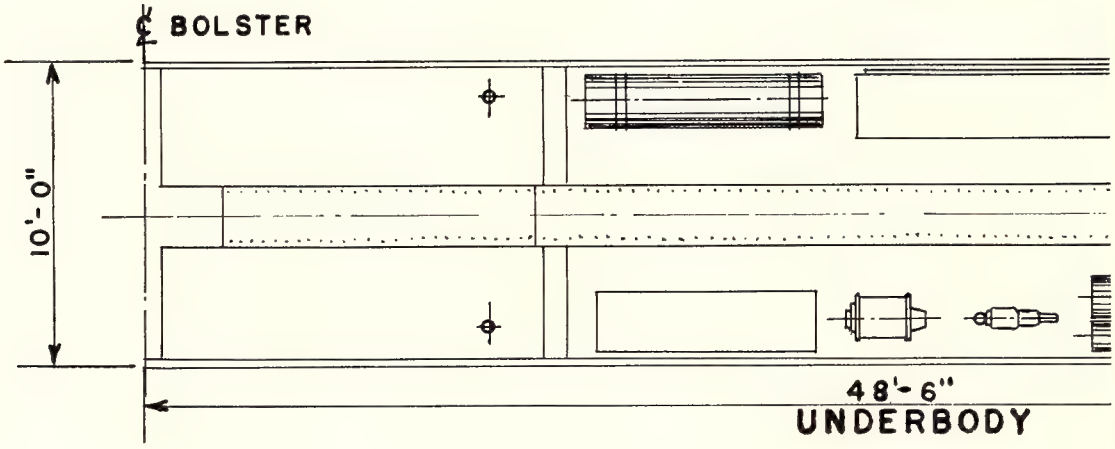
The car is now ready for the sides, which are cemented and bank-pinned to the roof, floor and intermediate supports. Cut off the heads and drive pins flush. Add all final details. such as platform railing, tail emblem, hand rails, grabs (made from staples), marker lights, etc. The sources for platform railings are varied and numerous. They can be made up from wire, wood, or bristol board, or

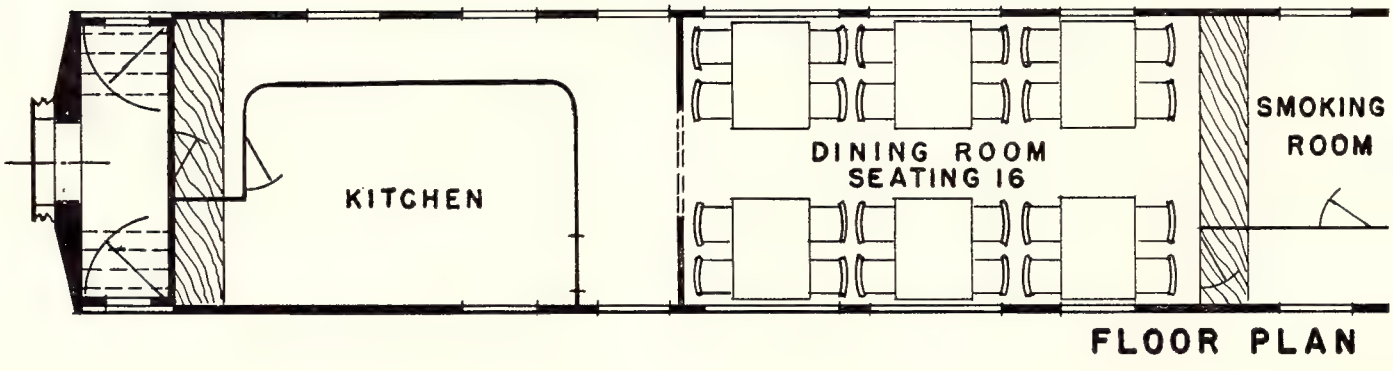
The main yards of the Barbaraton and Theapolis Railroad.

Dining-Lounge Observation Car

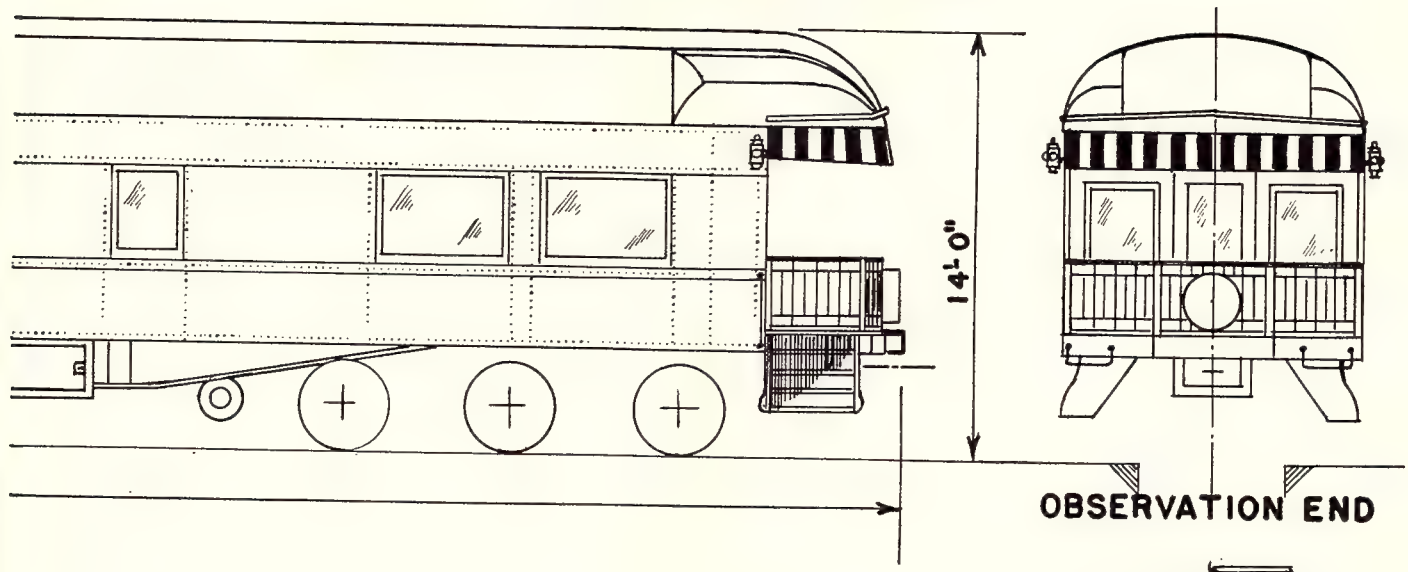


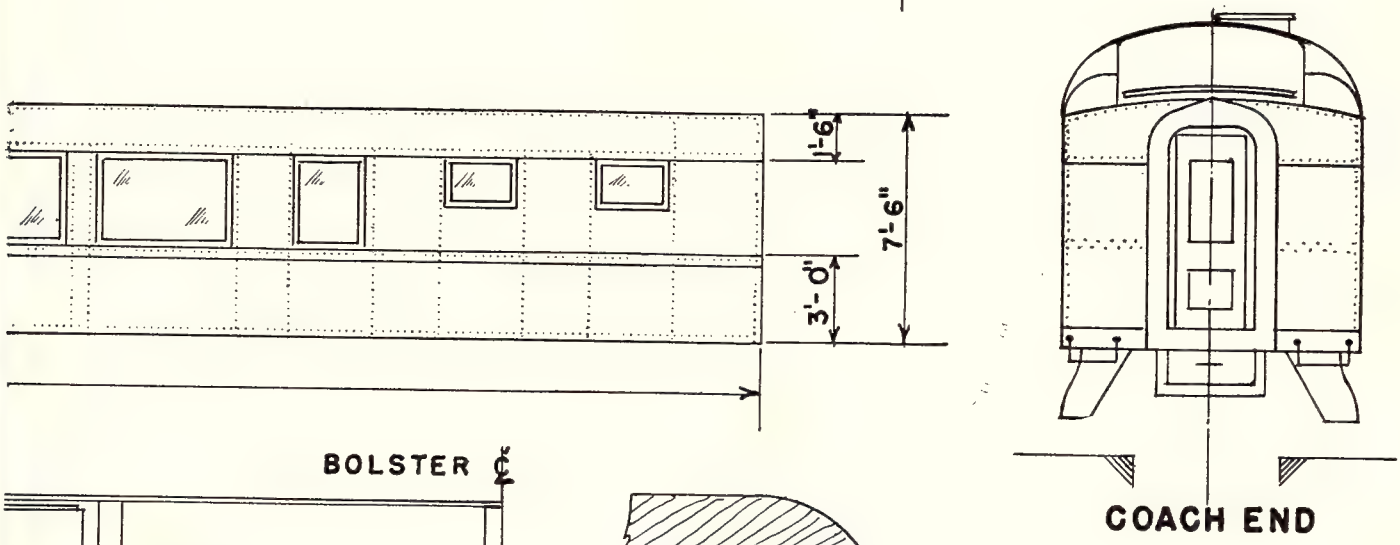


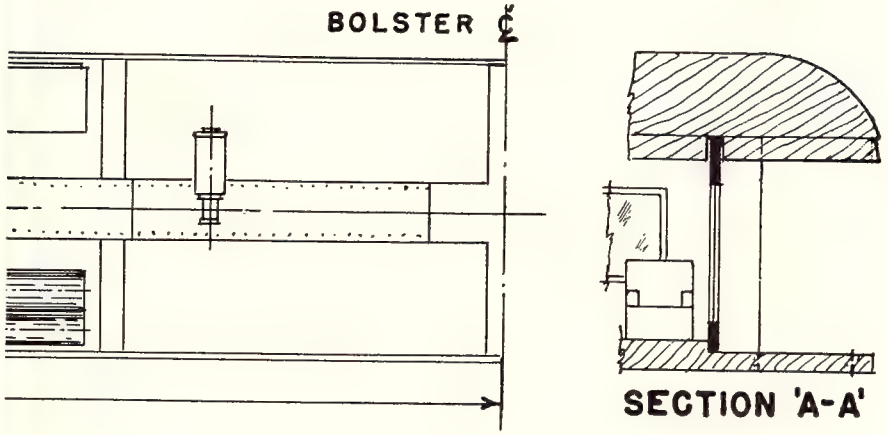


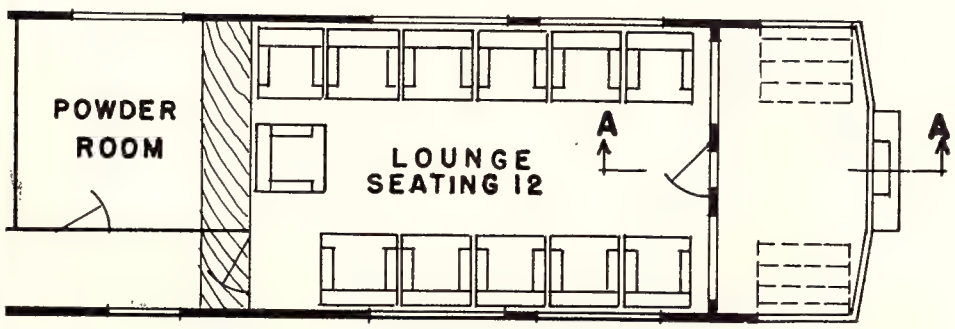


Scale: Full Size for "OO" Gauge









obtained as castings or stampings from manufacturers. I used a Nason brass stamping which is a beautiful job. Tail emblems are entirely up to the ingenuity of the builder—mine is a PRR keystone mounted on illustration board. Very effective, and remember, anything can happen on a model railroad.

Apply final paint coat to exterior of sides, roof, underbody, and wherever else needed. Allow plenty of time for paint to completely set, then apply decals and varnish sides only. The color scheme for my car is distinctive for the B&T, having aluminum roof, tuscan red sides, black underbody and gold lettering.

This car with its relatively short wheel base will go around NMRA minimum radius curves without toppling over the wayside structures. For that reason it is ideal for booming on the private pikes that you visit. In fact, I'm planning to build this car, as well as a drovers caboose, in all gauges so that when I travel over the miniature R.R.'s of the land I will be able to enjoy the near view as well as the panorama.

THE LAYOUT DOCTOR

BILL WORDEN of Brooklyn submits to the Layout Doctor an O gauge layout, approximately seventeen by twenty-two feet which he wants fixed up, including a more satisfactory yard arrangement. His motive power consists of a semi-scale Lionel 2-6-4 and an 0-6-0 switcher, while his rolling stock is one open and passenger car, twelve freight cars and one cabin car. Like the rest of us, his budget is "pretty limited" so he asked the Doc to take it easy.

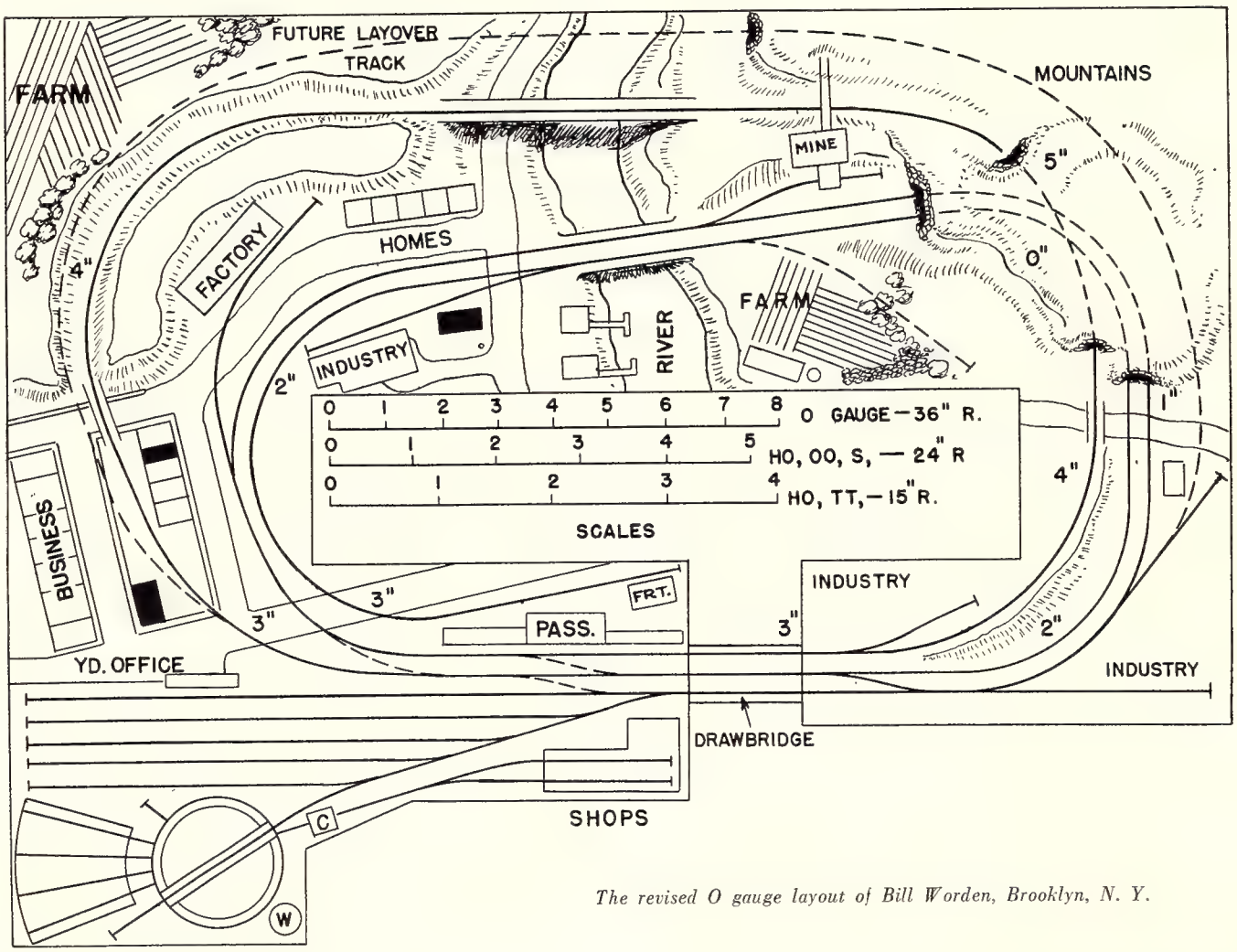
Bill's layout is very much like another *tin-platish* layout published just a few months ago in this column, two tangent ovals with a short stretch of single track common to both. I would suggest the same cure as before—a simple change over to an inside-out figure eight which would give a long run without turning switches at the expense of a little more trackage. Then I would move the passing track switch around to the site of the factory spur switch on the present pike which will permit a little better arrangement of switches so that a freight house spur can be added to the front station. At the other end of the passing track, a cross-over connects it with the main track again while the passing track continues on to become the beginning of the yard.

Considering the position of the engine-house, there is only one logical site for a yard and that is at the left front of the layout. That little protrusion on the platform is good for little else but an engine-house without drastic track changes, so we must keep the engine facilities there. By moving the turntable into the corner of the protrusion, space is provided for several yard tracks with a slight widening of the platform. To get better length on these yard tracks, I have moved the entrance passageway somewhat to the right.

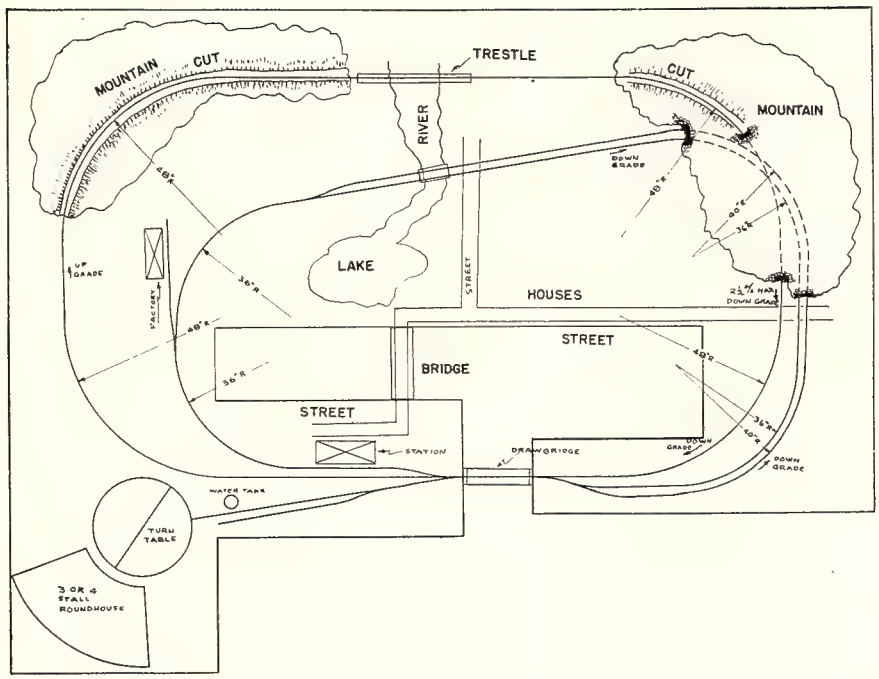
Worden has a single track drawbridge across the entrance way which can easily be made three track. However considerable thought should be given to making this a permanent bridge or even continuing the platform on across the gap. Entrance to the operating space could then be gained by the expedient of ducking under.

Two optional cross-overs are shown by dotted lines just in front of the station.

A passenger or freight train in counter-clockwise operation simply pulls out of the yards after having been made up on the longest track. After circling the line several times (and perhaps hiding on the layover track when that has been added) the train takes the cross-over at right front on to the passing track. There the road



The revised O gauge layout of Bill Worden, Brooklyn, N. Y.



engine can back it into the yard, or can be detached while the 0-6-0 does the classification.

A clockwise train must be pulled out on to the passing track by the switcher where the road engine couples on and takes it through the cross-over onto the main line. At the end of the run, the train must stop on the passing track while the road engine uncouples and the same engine or a switcher does the shifting. Notice how the dotted optional cross-overs would facilitate getting either the road engine or a switcher from the yard over to the rear end of the train in such a maneuver.

The circuiting of this layout would be very simple, just one control for the main line and another for the yard including passing track which is in reality a switching lead track. The layover track, if and when added, would be another circuit.

In my preliminary skirmishing with this plan, I toyed with the idea of having tracks to reverse the direction of the train, but out of deference to the owner's budget, I gave that up. For you who might be interested, the gist of reversing in this plan would be a wye at the front passenger station leading back along the river valley to another wye into what is indicated as a future layover track. This track would go under the high trestle, but would cross the double track line with a pair of level crossings.

You will notice that I have included scales of feet in this and its companion plan so that you may utilize it no matter what the gauge. Of course in my change of scale from that intended, great care should be exercised to adjust the vertical and track clearances to suit the new gauge or scale. For instance. if the plan should be built by another reader full size 17 by 22 feet, but with HO gauge track and 36" minimum-radius, he would find his tracks about twice as far apart as usual on parallel tracked stretches.

MAY I quote from the abject letter received from Phil Crowell of Bakersfield, California? I may? Thanks.

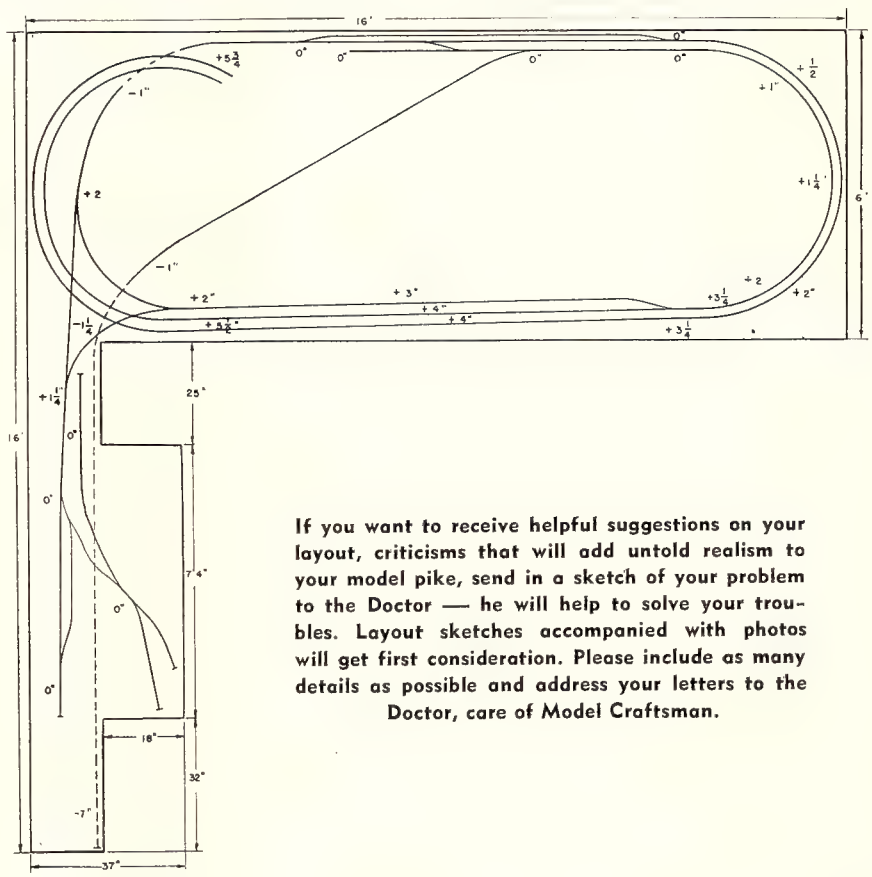
"Enclosed is a rough sketch of my so-called layout. Or I should probably say my unfinished excuse for a layout. It has just grown without rhyme or reason into its present condition over a period of eighteen months. I am definitely dissatisfied with it as far as I have gone, but am at a loss as to where and how to start overhauling the darned thing. All turnouts are #6. The line which runs down to the workbench is purely a utility line to pick up such cars as I may have been working on."

The area Phil has available for trackage consists of a basic six by sixteen foot rectangle with a three by ten foot appendage at one end. While he has what at first glance appears to be the largest double tracked oval possible on the six by sixteen foot table, he has shown the originality not to do this: you will note that the left end of the "oval" climbs up to a double track dead end.

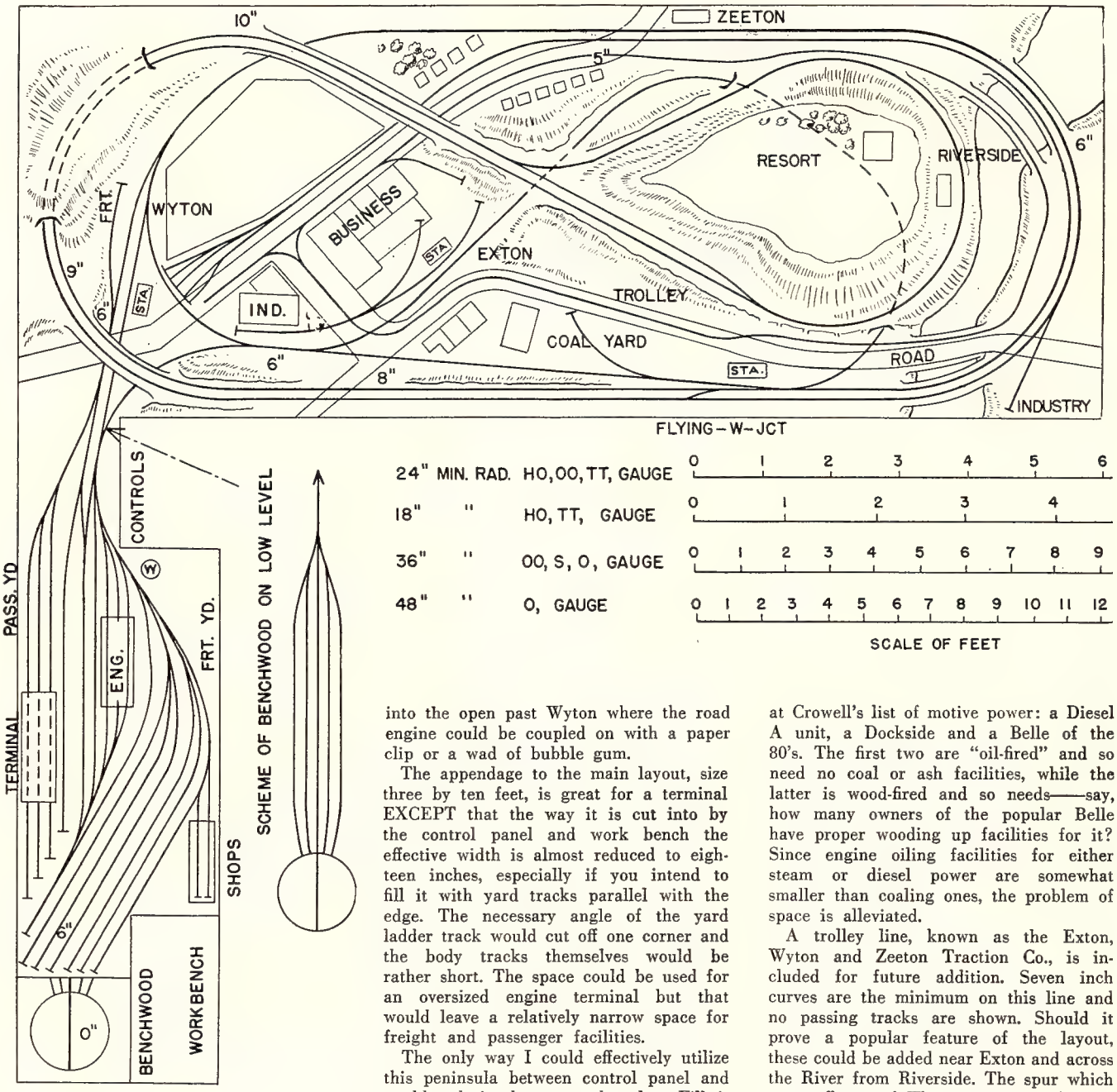
This unfinished double track up "in the sky" that way has only one logical termination and that is to a reverse loop, which you will note I have done. The reverse loop goes through the resort station of Riverside.

The reverse loop will permit the operation of a train out from the terminal, around the loop and back to the terminal again. The wye trackage at Wyton permits a continuous run without returning to the terminal—just yet. It is an easy matter to add another reverse loop from Flying W Jct., under the resort through Exton to Wyton. Incidentally since this track is at a lower level, it should be constructed before the Riverside loop. Now a train can be reversed and "*re-reversed*" without going into the terminal.

I have moved the cross-overs and sidings at Zeeton around to Flying W Jct. where they will be more accessible and serve more purposes. The double track now extends only from Riverside loop down to the Flying W Jct. While double track appears to extend on past that point to Zeeton, in reality the outside iron is the main line while the inside iron leads to the low level which I have made into



If you want to receive helpful suggestions on your layout, criticisms that will add untold realism to your model pike, send in a sketch of your problem to the Doctor — he will help to solve your troubles. Layout sketches accompanied with photos will get first consideration. Please include as many details as possible and address your letters to the Doctor, care of Model Craftsman.



a terminus called, quaintly enough, Benchwood because a Mr. Bench once lived there.

If I were Mr. Crowell, I would rip up the top level "terminal" trackage and baseboard and play around with Benchwood which can serve as a nice terminal although not true to prototype practice. Notice that the switches which divide the terminal trackage are outside, near Wyton. The exact pattern of the tracks for Benchwood is not shown since it would complicate the drawing too much, however the scheme is shown. The turntable serves two purposes: to reverse the engine of an arriving train and also switch it onto another track to go to the other end of the train. Automatic couplers should be used so that when the tracks are covered over, the connections for departing trains can be made. If this is impossible, a switcher could come from another track via the turntable and push the train out into the open past Wyton where the road engine could be coupled on with a paper clip or a wad of bubble gum.

The appendage to the main layout, size three by ten feet, is great for a terminal EXCEPT that the way it is cut into by the control panel and work bench the effective width is almost reduced to eighteen inches, especially if you intend to fill it with yard tracks parallel with the edge. The necessary angle of the yard ladder track would cut off one corner and the body tracks themselves would be rather short. The space could be used for an oversized engine terminal but that would leave a relatively narrow space for freight and passenger facilities.

The only way I could effectively utilize this peninsula between control panel and workbench is shown on the plan. Fill it with sort of an elbow between yard ladder and body tracks which run at an angle to the edge. The innermost freight yard track is meant to serve as an inbound track. The extension of this track beyond the last switch is to permit the engine to escape. By a happy coincidence of planning, this same track also serves to permit an inbound passenger engine to escape via the track next to the enginehouse. On the other side of the passenger platform is the outbound passenger track, while under the high level passenger station run several passenger storage tracks. The space left between passenger and freight facilities fills up nicely with parallel engine storage tracks.

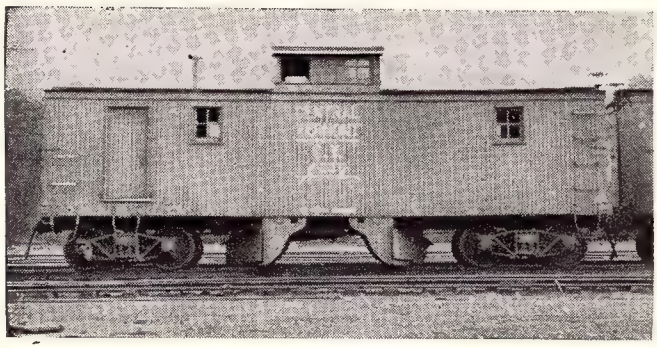
This engine terminal is somewhat cramped. I worried for a while where to put a coaling pocket and ash pits except strung across the tracks just outside the enginehouse. The water tank of course could be put in a remote place with standpipes between tracks. Then I looked at Crowell's list of motive power: a Diesel A unit, a Dockside and a Belle of the 80's. The first two are "oil-fired" and so need no coal or ash facilities, while the latter is wood-fired and so needs——say, how many owners of the popular Belle have proper wooding up facilities for it? Since engine oiling facilities for either steam or diesel power are somewhat smaller than coaling ones, the problem of space is alleviated.

A trolley line, known as the Exton, Wyton and Zeeton Traction Co., is included for future addition. Seven inch curves are the minimum on this line and no passing tracks are shown. Should it prove a popular feature of the layout, these could be added near Exton and across the River from Riverside. The spur which wyes off toward Wyton station could also be extended across the wye tracks with level crossing and down along the wall, replacing the rearmost passenger storage track. A reverse loop on this line would have to be beyond the workbench.

For access to the hidden Benchwood yard, as much as possible of the track and scenery above it should be easily removable—the scenery in the Wyton wye, the Terminal passenger platform and even sections of the other passenger tracks.

I won't go through the usual routine of tracing the route of a train out from the terminal. Let it suffice to say that leaving the terminal a train can wye off in either direction and then circle the Flying W-Zeeton—Wyton oval in either direction with as much reversing and re-reversing as desired, then head back into Terminal or into the remote terminus of Benchwood. It should be possible to keep two trains at once running on the main lines.

(*Continued on page* 45)



The author, on a fan trip between New York City and Montreal via the CP, B & M, CV and the New Haven Railroads, came across this CV Flanger parked on a White River Jct., VT. siding, ready to keep the main line open.

Central Vermont Flanger

By HAL CARSTENS

TRAIN #6065, a B & M Sunday only local, pulled us from Woodsville, New Hampshire to White River Junction, Vermont. This is a lazy sort of train, taking an hour and twenty minutes to cover the forty miles. A Consolidation, Engine #2649, did the hauling while we did some listening to the congenial B & M crew who recommended a hotel for us to stay at overnight in White River Junction.

We pulled into White River Junction at 6:30 P.M. and headed right to the Gates Hotel. The Gates is unpretentious but it is clean and frequented largely by railroaders. It was getting too dark for pictures so we left our cameras and wandered down towards the station, right opposite our hotel, to get a look at the layout.

The station itself was a very modern and clean looking structure and atop the roof was a weather vane shaped like a locomotive. Tracks surrounded the station on all sides and trains were coming and going the whole time we were there. Maybe some New England lines don't have much traffic, but it can't be said of White River.

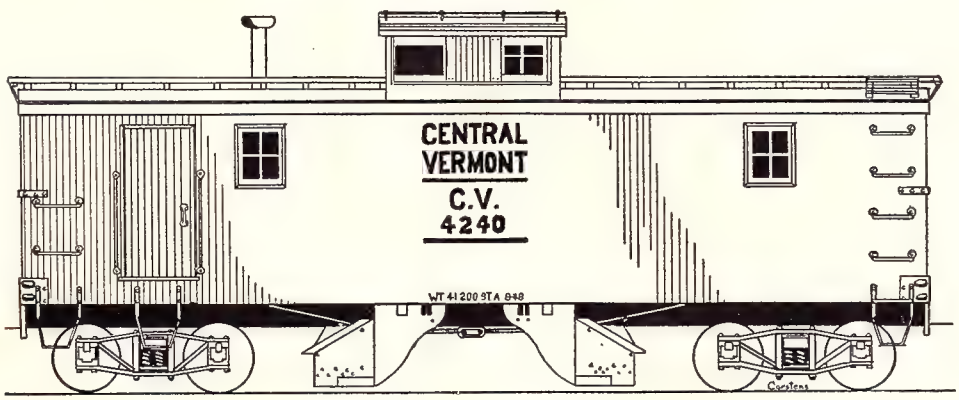
The next morning we walked the tracks over to the Central Vermont roundhouse and asked permission to take a few pix. We were told it was all right. The roundhouse was a honey of a building and just about the right size for a small club. It deserves an article in it's own right some day but I might add that there was a medium sized turntable, ash pits, sand tower and coaling station and several sidings full of snow fighting equipment. One of these cars was a snow flanger.

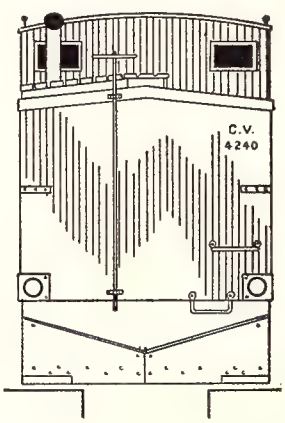
The car is basically a box car with windows, to which a cupola has been added, on top. Underneath, between the trucks, is a metal flange which shoves the snow off the track. It's not designed for fifteen foot drifts and isn't used for such. Rotary plows and large wedge plows are used for that type of snow but, nevertheless, New England roads find plenty of use for these cars in the winter. But you don't have to be a New Englander to use snow fighting equipment. The New York Central (and probably all of the rest) used them just last winter to keep the lines clear during the Big Snow of '47. The Central had a Pacific (K-11) hauling the flanger and a caboose and the train kept going up and down the line until the weather cleared. Tinplaters will immediately see a great possibility in an operating car for their annual snow scenicked Christmas Tree layout.

Need I go into construction details? Look carefully at the plans and if you're still not sure on what to do, look over any one of the Model Craftsman's back issues for an article on box cars or cabooses. The construction procedure is almost always the same with only the smaller details and the actual dimensions varying. One new item on this car is the actual flanger itself. Located underneath the car, it isn't too conspicuous, even at a short distance in it's prototype tuscan red. Painted a bright orange on a model, it would show up like a sore thumb.

The flanger could be cut from a piece of tin can or thin sheet brass but guess what would happen if your flanger protruded down just a bit too much or if your trackwork was bumpy? Yes suh, there would be fireworks. So leave your soldering iron and tin for your locomotives and stick to good old bristol board or oaktag for your flangers. Nobody'll ever know the difference, "hardly"! In fact, to show how well bristol board construction holds up through the years, let me say that my first HO car, a Megow caboose, was built from these materials, with a wood floor naturally, and she's held up as well as any metal car. Built in 1940, she is still in perfect condition, especially after her recent shopping when she received a pair of new postwar trucks. plastic steps and new paint.

The Central Vermont's flanger was painted in the old familiar tuscan red with white letters and numbers.





HO GAUGE

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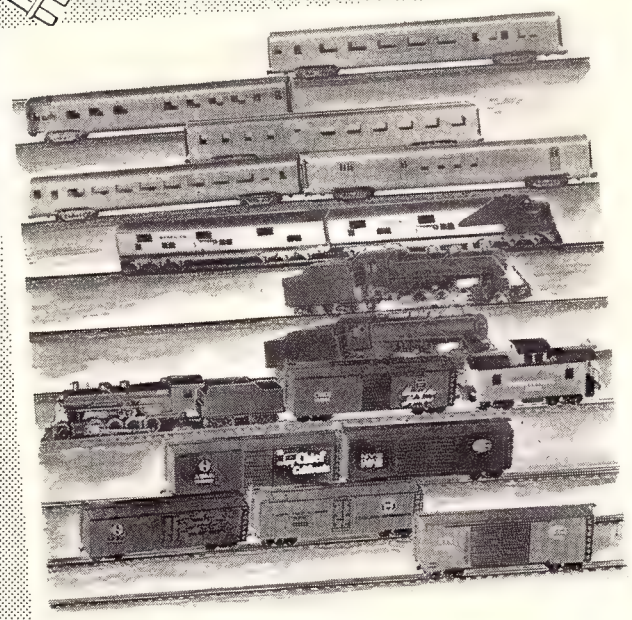

. . . just Look at this Equipment!

PRICE LIST

(Concluded on page 28)

1000	Diesel A unit with power	Kit	$23.00
1025	Diesel B unit with power	Kit	20.50
1150NP	Diesel B unit not powered	Kit	12.50
1031	Diesel Power unit and front truck (assembled)		17.50
1030	Diesel Power unit only (assembled)		14.50
250	Coach, Aluminum, 80 ft. including trucks	Kit	2.75
251	Postal, Aluminum, 80 ft. including trucks	Kit	3.25
252	Pullman, Aluminum, 80 ft. including trucks	Kit	3.25
253	Observation, Aluminum, 80 ft. including trucks	Kit	3.75
254	Diner, Aluminum, 80 ft. including trucks	Kit	3.25
2050	14 Tie Sections (9 in. long, total 10½ ft. and 21 ft. rail)	Kit	3.75
2051	10½ ft. Tie Sections only, 14 pieces 9 inches long	Kit	2.00
2052	21 ft. Rail (only) 2 10½ ft. sections	Kit	1.75
2000-R	No. 7 Switches - right (assembled)		3.00
2001-L	No. 7 Switches - left (assembled)		3.00
350	Passenger Car Trucks (assembled)		1.00
650	Freight Car Trucks (assembled)		.90
300	Couplers, Passenger (assembled)		.25
600	Couplers, Freight (assembled)		.25
3000	D. P. D. T. Center-off Switch (assembled)		1.65
A Set	Assembled Diesel A Set: 1 Diesel A unit, 3 No. 250 coaches, 1 set No. 2050 track		40.00
B Set	Assembled Diesel B Set: 1 Diesel B unit, 1 Postal, 1 Pullman, 1 Observation Car, 1 set No. 2050 track		40.00

Turn to page 28 for continued price list and further illustrations.

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STAR-LINE MODELS, INC.
Mineral Wells, Texas
Write for additional information.

See additional STAR-LINE ad on page 27.

WASHINGTON D.C.

SEE CORR'S NATION'S HOBBY SUPPLY ON PAGE 41 *(copy received too late for classification).*

CLEVELAND

Cleveland's Outstanding Downtown Model Store

A complete stock of all NATIONALLY ADVERTISED

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O-6-O switcher, assembled	$27.00
2-8-O Engine and tender kit	26.50
Coach car kits	2.75
Diner car kit	3.25

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(Continued)

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New Jersey—Haddonfield
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The Scale Model Railroad Shop
Serving Railroads exclusively, and in all Gauges.
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Friday until 9 P.M.

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SPECIALIZING IN TT GAUGE
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M & G HOBBY SHOP
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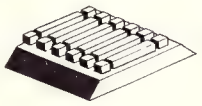
(See page 28 for additional Chicago listings.)

TEXAS



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TT ROADBED
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Straight (2' length) ..... 17c per ft.
Curved (18" length) ..... 22c per ft.
18", 20", and 24" radii
Switch blocks, No. 7 ..... 65c each
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A TT Fine Gauge

See How Much You Can Buy . . for so Little!

PRICE LIST

(Continued from page 26)

TT 1/10″ Scale Model Railroad Equipment

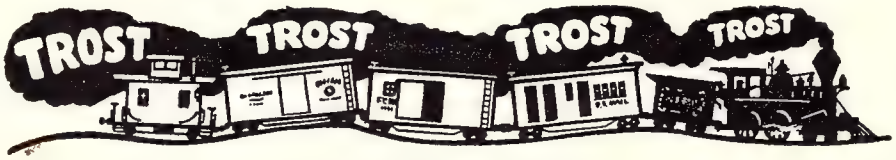
No.		Kits
2800	2-8-0 Consolidation (including motor and No. 1600 tender)	$26.50
1550	0-6-0 Switcher (includes motor and No. 1600 tender)	22.00
1600	2-8-0 Tender only for 0-6-0 or 2-8-0	4.50
550	Makes Box Car, auto car or reefer (metal sheath)	1.50
551	Makes Box Car or reefer (wood sheath)	1.50
552	Makes High Side Furniture or Auto (wood sheath)	1.50
553	Caboose	2.00
554	Single Sheath Outside Braced Box Car	1.50
555	Stock Car	1.50
556	50′ Auto Car, Steel Sheath	1.50
557	50′ Auto Car, Wood Sheath	1.50
558	Flat Car (Available June)	1.50
559	Gondalo (Available June)	1.50
560	Hopper (Available (July)	1.50
	Above kits include trucks and hardware, but not decals or paint.	
1561	Decals—Steam Locomotive, B & O, C B & Q, Penn., N. Y. C. or Santa Fe — pair	.15
490	Decals—Freight or Caboose, set of 5 assorted, (B & O, N. Y. C., Burlington, Pennsylvania and Santa Fe)	.35
491	Decals—Reefers, set of 5 assorted, (BREX, SPRD, PFE, ART and FGEX)	.35
1020	Decals—Diesel, per pair (Santa Fe, N. Y. C., or Burlington)	.40
260	Aluminum Car Name Plates, Santa Fe, N. Y. C., Burlington or Pullman — set	.20
3001	Speed Control (assembled)	2.50
3002	12 Volt Power Pack, including controls (assembled)	17.50

Turn to page 26 for additional price list and illustrations.

ORDER FROM ANY TT GAUGE DEALER OR VISIT THEIR STORES

CHICAGO

(See more CHICAGO TT ads on page 27.)



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TT

Pre-Fab Track, 3 ft. .....$ .85
HO Rail clipped to Black fibre tie strip stamped to TT Gauge.
Fibre Tie Strip 100' $3.50
As used in above.
Switch Tie to Match—1 ft. ..... .10

Switches to follow.

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We have the entire line of TT merchandise —

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H. P. PRODUCTS CO.
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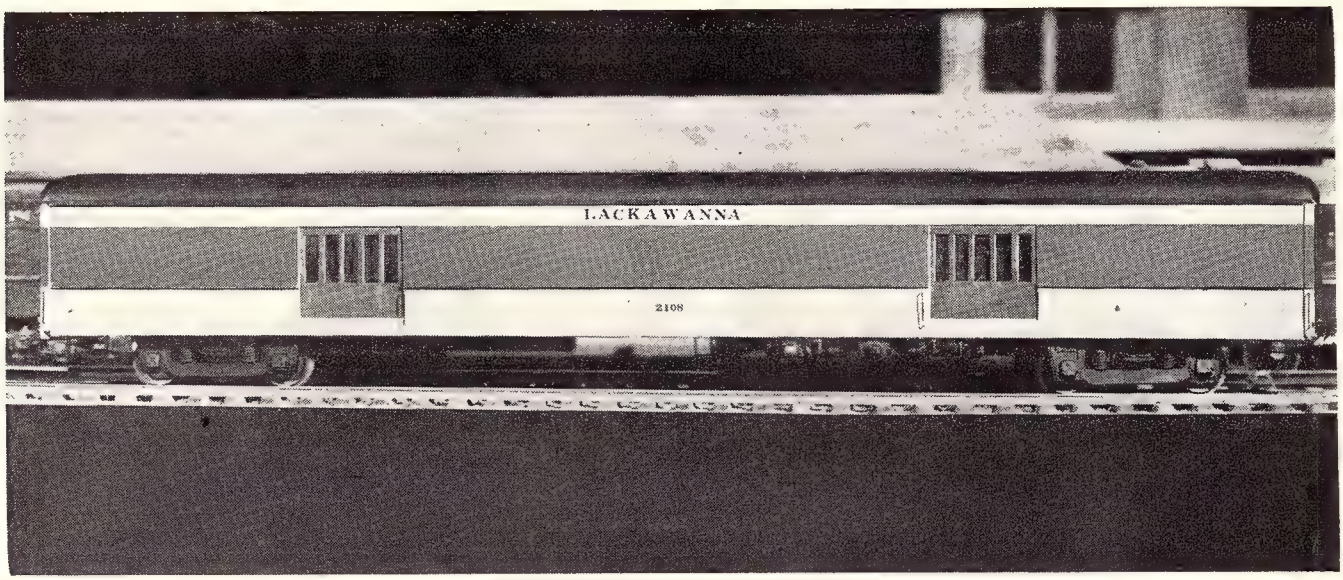


Streamlined Baggage & Mail Cars

By WARREN B. CRATER

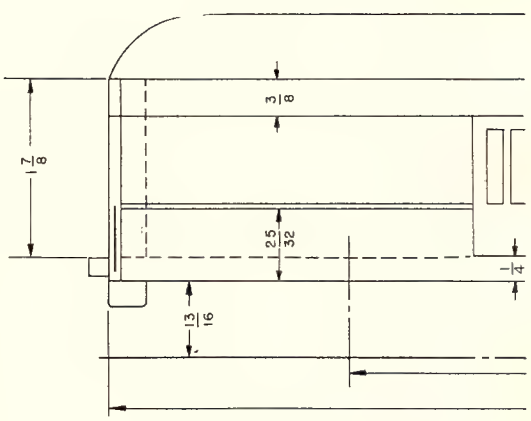
TO put the finishing touches on our *Mixed Breed Special*, this month we take up the construction of the old light weight "Royal Blue" Baggage mail and the Lackawanna 70-foot baggage car which is now "streamlined" painted.

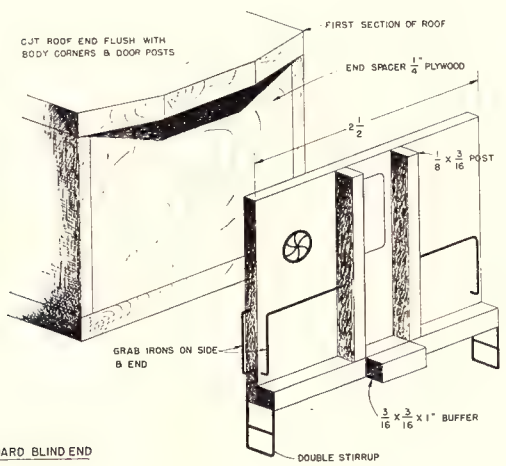
Frankly, I am not building the mail car because of limited storage track capacity on my model pike—the Diesel and six cars are quite a train on a model road. Then too, I already have a standard R. P. O. in a train of standard equipment to handle mail service on my New Jersey Terminal R.R.

As has been suggested previously in this series, the accompanying drawings may be used with most any prototype color scheme. In some cases, it will be necessary to rearrange windows and doors. The "Royal Blue" mail car drawing is shown because it lends a basis for many other similar cars.

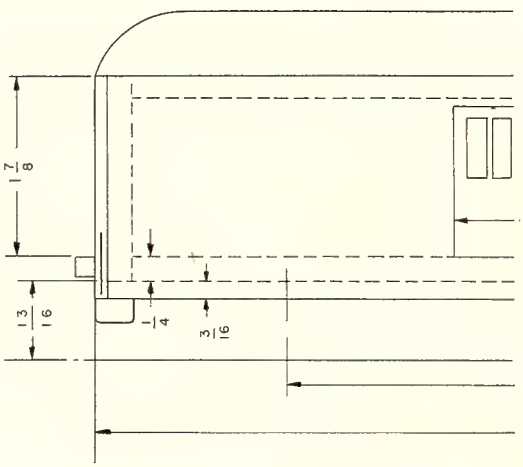
By using the basic dimensions as shown and a photo or even a "look see" of your favorite prototype, an authentic model may be easily built.

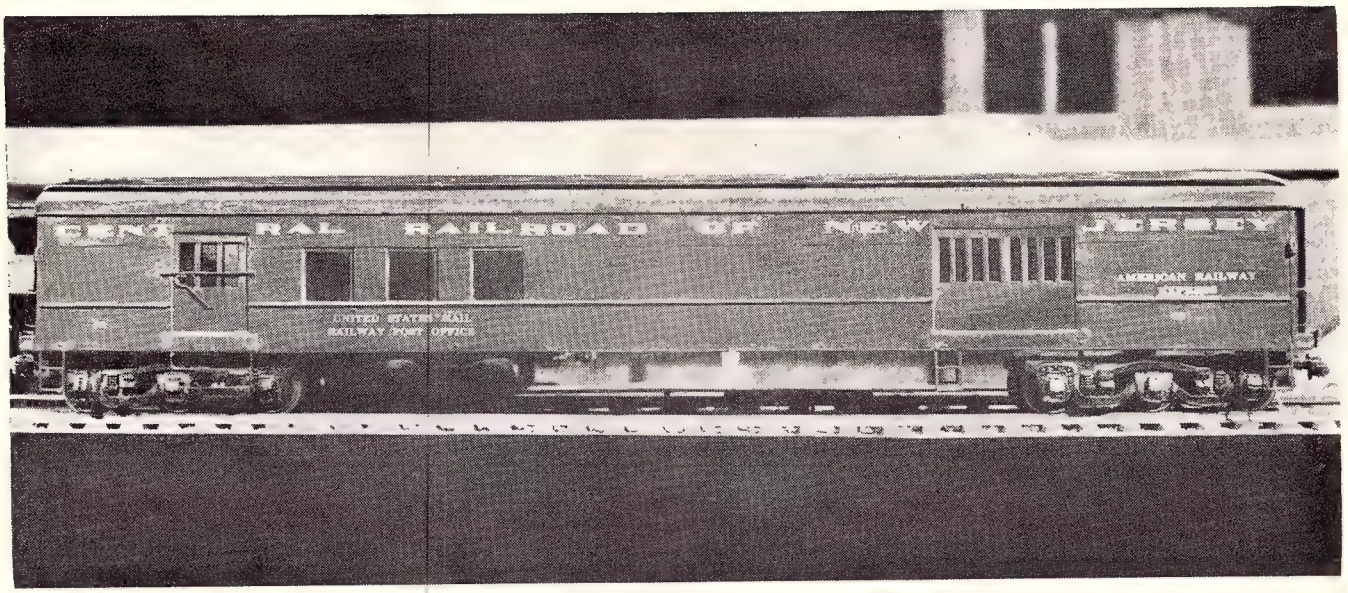
A full mail car will have a mail door at each end located as at the right end of the B & O drawing. The windows, from three to six in number, will be evenly spaced between the doors. All mail car windows have from three to




CUT ROOF END FLUSH WITH BODY CORNERS & DOOR POSTS
FIRST SECTION OF ROOF
END SPACER 1/4" PLYWOOD
2 1/2
1/8 x 3/16 POST
GRAB IRONS ON SIDE & END
3/16 x 3/16 x 1" BUFFER
DOUBLE STIRRUP

OLD STANDARD BLIND END





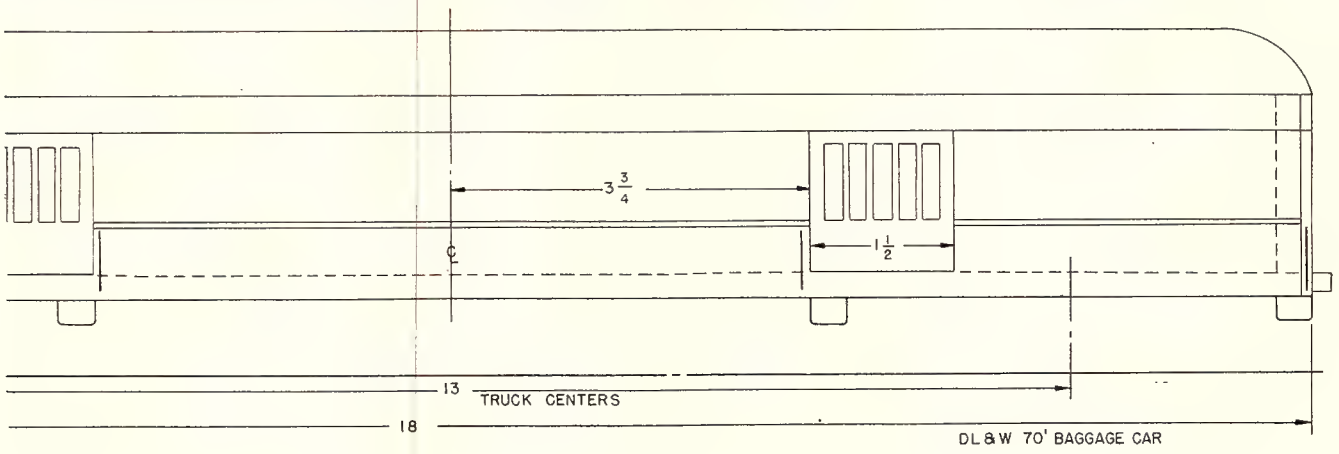
five horizontal bars inside to protect the glass against breakage.

The mail car drawing shows standard diaphrams. If your favorite prototype uses full width diaphrams, refer to the "Vista Dome" drawing in the July Craftsman.

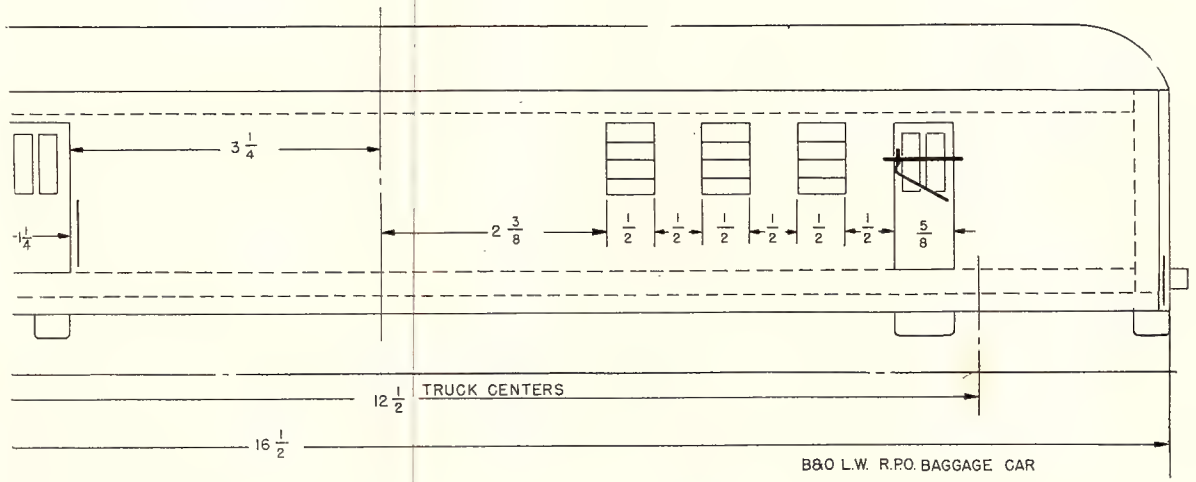
Building these cars is generally similar to that of the coaches, etc., described in the preceding articles. Cut and assemble the roof, floor and ends as described for the coaches. Additional spaces should be provided at the edges of doors to allow for setting grab irons as well as strengthening the sides.

The sides are best made from card board about $\frac{1}{32}$" thick which is available in large sheets at stationery stores. Use two thicknesses. In the outer sheet, cut out all window and door openings with a sharp wood chisel on a flat board. Cement to the still blank inner sheet. Lay out window frames $\frac{1}{32}$" at the top and sides and $\frac{1}{16}$" at bottom from the opening in outer sheet. Also at this time, lay out the windows in the baggage and mail doors. Cut these out with a sharp wood chisel.

(*Continued on page* 43)



PLANS SHOWN ONE-HALF SIZE FOR "O" GAUGE



Getting Started—

PART V

By J. R. BARKLEY

AT the close of the July article, we had the layout to the point where the main line was fairly well established and operation was possible over it. By this time, the type of layout and the movements desired to be made, as limited by space available, should be made accordingly. There is a great temptation to put in a maze of tracks here and there to make the set-up look more "railroady." This thought is all right if not carried to an extreme. You already have operation, so if you don't go in over your head and line up more work than can be accomplished the added track or siding does add a desirable scenic effect, even though it may only be used to store a couple of cars or simulate an unloading operation at some warehouse, why then I believe it is worth while.

The same though applies to yards and terminals. If, when the yards are designed to perform certain fundamental switching movements it is found that there is still available space left, then by all means add another track or two. The extra tracks can be used for storage of cars that are defective in some respect so that you do not wish to run them. They will still add a lot to the over-all picture. What I am trying to sell you on is to do a 100 percent perfect job on the track work and switches that are to be *run on* and not to start a lot of things that will prevent you from so doing.

A good, simple rule to follow is this: If a track or switch has the appearance of being superfluous, or if it merely duplicates the function of another, then leave it out. This is very simple. A siding can be justified, at least in appearance, by either a building, warehouse, or other trackside structure, or by placing it in a strategic location, adding another switch bringing it back into the line and calling it a passing siding even though you may never operate but one train and never use the siding.

So now is the time to look over your layout as it stands and decide just what is desired to be done in the way of additions and what *can* be done. One factor to be considered is the type of scenery to be added. A grain elevator would look out-of-place if it were perched on top of a mountain next to a coal mine. So pick out a theme subject and stick to it. Make everything on the railroad subordinate to the supposed purpose for which it was built. Railroads do not hap-hazardly lay their lines here and there, they are always going some place. The prototype roads are after more customers and more business and before they go to the expense of buying up right-of-way and laying tracks to a certain point, they are pretty certain it will pay off, either by additional freight or passenger revenue or by reducing operational expense. The reduction of expense might be accomplished by avoiding a long grade, straightening the track by a new route or by picking more solid and level ground thus getting away from expensive cuts, fills, bridges, etc.

If you want your track to go through a tunnel or cut, try to build the hill or mountain so that it appears there was no other way to do it but to tunnel or cut through. Don't just set a mountain down over the track with a hole cut in it with lots of room on both sides. The same thing applies to bridges. A real railroad will lay track for miles just to avoid expensive bridge construction or tunnel boring jobs.

The foregoing suggestions are more or less fuel for thought at this time as in model railroading we do a lot of things backwards as in the building of scenery. It is already there when the real railroads build their lines but we lay track first and then cut the scenery to fit, though the scenery may have been planned even before a rail was laid. A little thinking as we go along will result in far better appearance and operation.

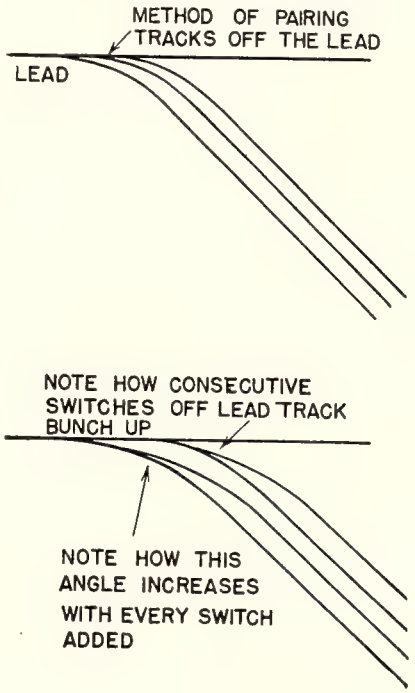
Now if you have arrived at a general idea of the topography of your layout, you probably will know where there is to be a cut, fill, bridge, etc. Bridges and culverts are best built before scenery is added. A simple girder bridge does not take long to build and a culvert is even easier and they both add a lot of railroad flavor.

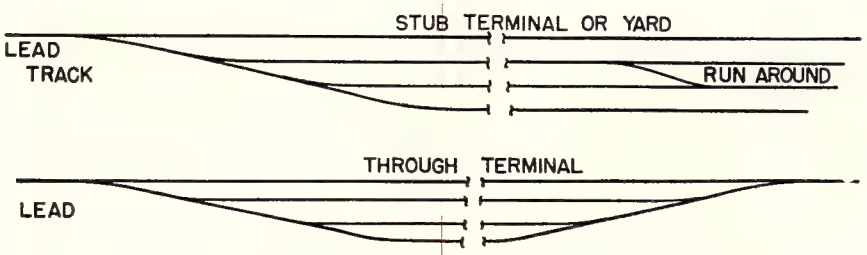
To get the utmost out of model railroading, try building a model of a real culvert or bridge. It may be modified in many respects and still look enough like the original to be recognizable. Try taking photos and making sketches (to scale) and then sit down at your bench and see what can be done with a few pieces of wood and cardboard. You will be pleasantly surprised I am sure. Tunnel portals also are extremely easy to model. The side walls of tunnels need only be carried back a few inches into the bore as any further than that they will be invisible anyway. The walls can be stiff cardboard painted flat black and smudged.

Scenery, cleverly planned and artfully executed, will do much toward making a layout look larger than it really is and also will make the run of the track seemingly longer. Tunnels or deep cuts in the proper places will conceal the trains momentarily and disguise the actual round and round course traveled on a continuous run type of layout and make the trains appear as though they were actually going somewhere.

The author's Pacific Valley Lines HO layout was in the form of a figure eight with one loop of the eight lying inside an extra loop. This was accomplished by using two levels and four underpasses. At one point, a train would be going east on one track and when returning west was on an adjoining track on the same level. It was very difficult for a visitor to figure out just where a train was going and where it would appear next. If he did guess where it would next appear he would probably miss in selecting the track it would be on. This all adds to the enjoyment of the hobby and gives it a little zip. It could hardly have been done without proper scenery.

Now for the matter of yards and terminals. Assuming that most of you will be limited by space, I am going to pass on a few hints and suggestions, learned the hard way—from sad experience. First of all, let us examine the problem with the realization that we cannot begin to model even a small freight classification yard, to scale, in its entirety. A big city's freight yards may extend for miles and a scale mile in O gauge would be 110


METHOD OF PAIRING TRACKS OFF THE LEAD
LEAD
NOTE HOW CONSECUTIVE SWITCHES OFF LEAD TRACK BUNCH UP
NOTE HOW THIS ANGLE INCREASES WITH EVERY SWITCH ADDED



feet. In HO it would be about 61 feet so you see we will have to do plenty of scaling down and eliminating. There are lots of other facilities at a large terminal such as car building shops, machine shops, storage yards, service and inspection tracks, and locomotive servicing facilities with round house, boilers, sand and ash houses and pits, a steam cleaning and washing rack and a lot of other things too numerous to mention. So what we have to do is pick out one or two of these things and by scaling, fitting and cutting, get them down to the size that will fit in the space we have. For instance, take the freight yards. A pretty fair model yard that will take care of simple switching operations and store quite a number of cars could consist of, say four tracks and three switches. If space is really at a premium, you will find that branching off with one track and then splitting that track with a separate switch into a pair of tracks will take less room than branching off the lead track with consecutive switches. This will cut down the width of the yard, especially if the tracks have to curve after leaving the lead track.

An efficient little yard may be built by having a crossover from one track to another at the terminal end of the yard thus forming a run-around or escapement for the engine when it precedes a string of cars into the yard. The engine can then un-couple and get out by crossing to the other track. This is especially useful at a small passenger terminal of the dead end type. The accompanying sketches will explain terms used and suggested track and switch arrangements.

Engine terminals can also be modeled in a small space by using only the bare essentials. A nice effect is obtained by merely having two tracks leading to a rectangular shaped, old style, engine house. Sand houses and coaling towers can be installed along one of the tracks. If more space is available and modern equipment is desired, you might have a turn table and a round house. Round houses can be built with from three stalls up to as many as desired.

You can all see there are many things in building a model railroad that must be planned for and space allotted long before you get around to the actual construction of them and good planning beforehand will save many a headache later on. The thing is, as I have stated before, not to try to do too much.

One of the most complete model railroads in HO that I have ever seen is in Orange County, California. It is a club layout and those fellows have really done a super job. It is quite large and has everything. Perhaps I should have said *had* everything as they have had to move again for about the third time. I believe they worked some four or five years in the building of that layout and the scenery was superb. There must have been thousands of man hours expended on it and, large as it was, there were no bare spots.

Much can be accomplished by a group of fellows such as these who are willing to work together. I have often marveled at the idea of a group made up of professional men such as doctors, lawyers, bankers, etc. and various types of tradesmen, truck drivers, salesmen, yes, and policemen, with a common interest in a hobby so absorbing that everything is forgotten except getting the pike to an operating **stage.**

Clubs are fine and while more railroading can probably be had it still gives one a feeling of pride to have his own layout. Then building projects may be entered upon without having to consult others and also the credit does not have to be divided.

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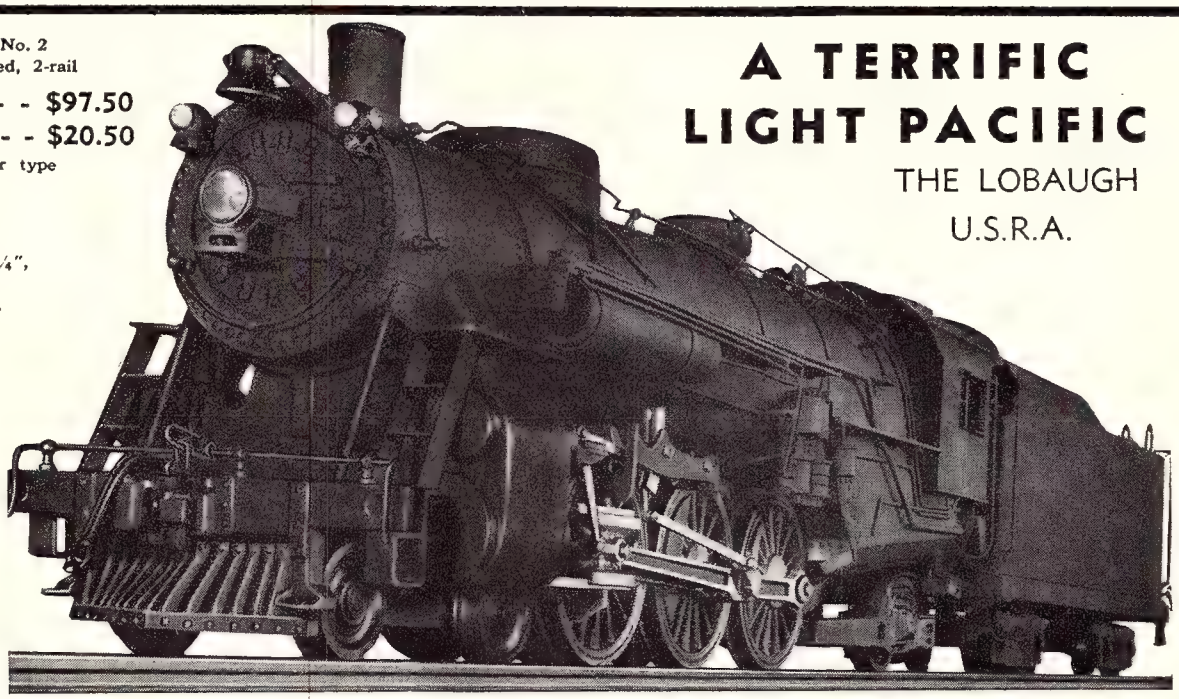

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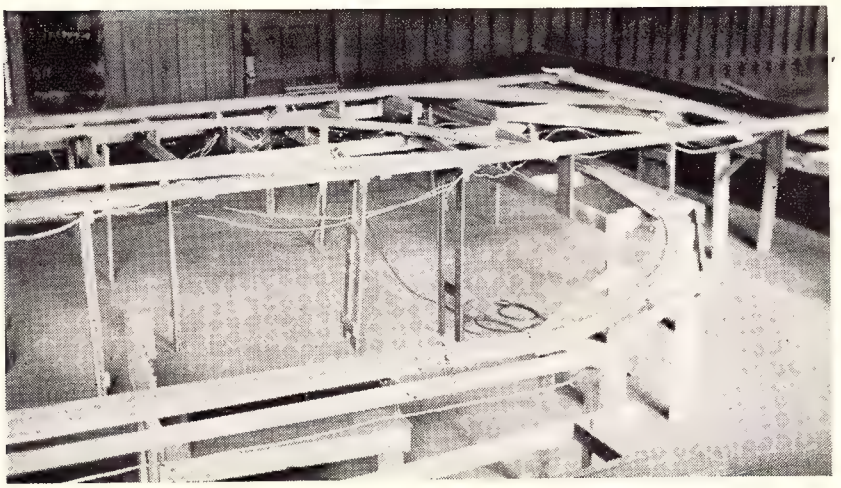
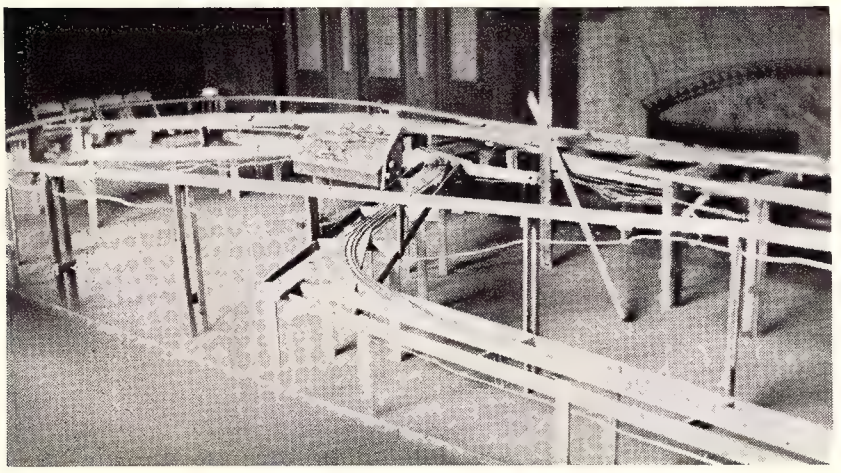
Philly's New Belt Line—

By LOUIS W. FELLER



The Philly Belt Line R.R. in the first stages of construction.



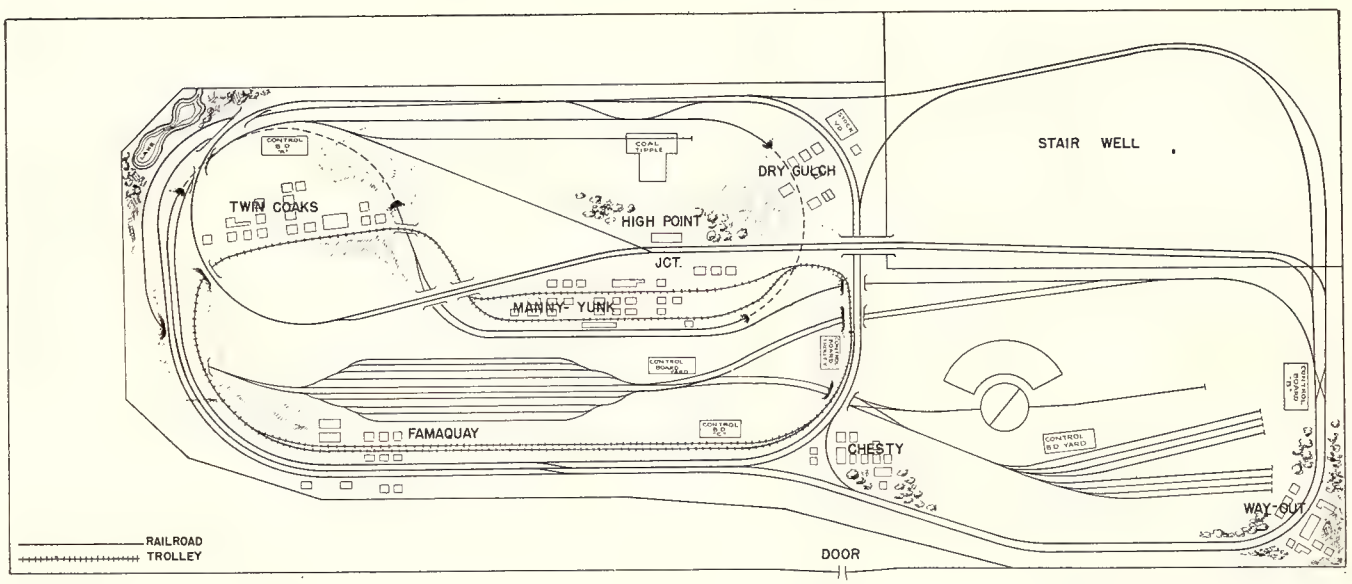
This shot, taken in 1947, shows the method of construction used.

LET'S take a trip over the new Belt Line of Philly's Brotherhood of Model Railroaders before the crowds convene at the B & O's 24th Street Station come next October 16 through 24. While this will be the club's "Annual" show, it has been five years since the last event. The old pike, started in 1937, was dismantled in 1942 to make room for the war-time USO room.

Now there is a larger and better railroad located in the 40' by 90' former lobby. This was made available by the redesigning of the Station. When the boys reorganized in 1946, it didn't take the model rails great friend, Larry Sagle, very long to find the new right-of-way.

Do you want to take an imaginary trip over the new Belt Line? Just a short walk over to Jackson Yards and we all climb on an open-end coach coupled behind No. 4. This old gal is an Atlantic and the oldest on the road. The Yard Master lets us out and we easily climb up the grade towards B Tower. Old man Greene waves at us from B Tower and we are soon rolling through Wayout. At Wayout. we notice a mail pouch clamped to the mail crane. Must be near time for the Express. As we skim towards Chesty, we can see the engine terminal and freight yards over on our right. We swing through Chesty on a long right hand curve and, once in the clear, the Engineer really opens up. We soon dash under the HI-Top Ry. and roll into the dry country. A long curve takes us around the sleepy town on Dry Gulch. With the thermometer over 100, we see little activity here.

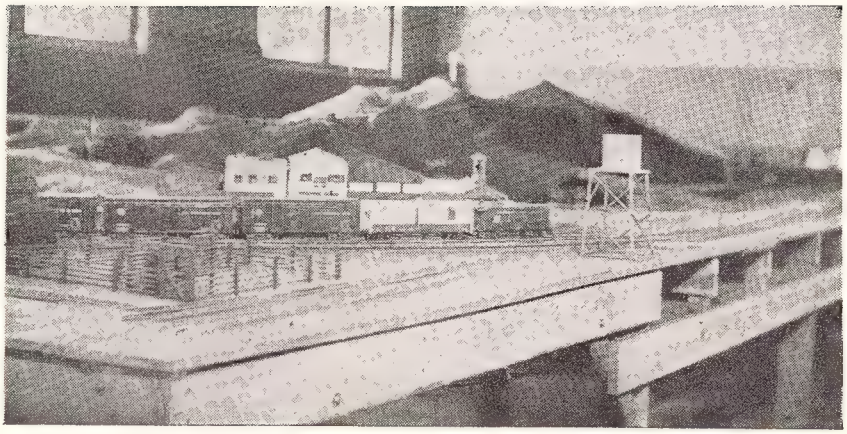
We see a coal mine over on our left and a large oil storage depot. The engineer brakes a little as we thread our way through the Main Interlock, but no delay



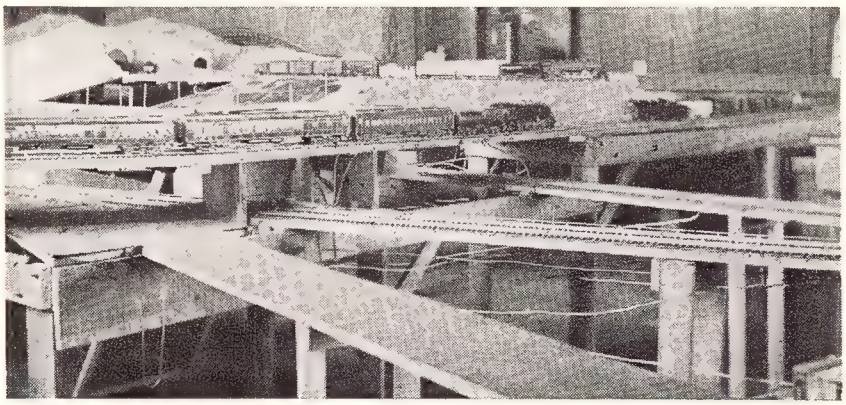
here as we quickly resume speed and roll between hills towards Tamaquay with beautiful rolling scenery all the way. A brief stop here for water so we all raid the station lunch counter for a quick snack. Four toots of the whistle and we are off again. This is Chesty over on our left and, as we settle in our seats, we see Wayout rolling by. That's funny, that mail pouch is still hanging there—guess the express is running a little late.

At B Tower, we start the long steady climb to the Summit. We finally arrive at High Point Jct, and all pile out for the view. To the North, in the far distance, we look down on Manny Yunk and a breath taking sight it is. To the South we can see the coal mines and, in the distance, the Dry Country. To the East, there is nothing but mountains with the three little tunnel portals where all three tracks disappear.

All aboard again and we bore right through the mountain. We coast along a high embankment and pass over a trolley line and the Valley Ry. far below. On the Valley, we can see a string of varnish flying along behind No. 65, a fast Pacific. All down grade now and it seems we are forever curving to our right. We ease into another interlock and through a double slip and on over to the trackage of the Valley Ry., another Belt Line Subsidiary. We are still rolling downgrade and we dive into a long tunnel. As we burst into daylight again, we are coasting to a stop at the valley town of Manny Yunk. A



View from stockyards of Dry Gulch looking up at High Top Mountain. Chesty, showing the yards, main line and the summit of High Top Mountain.



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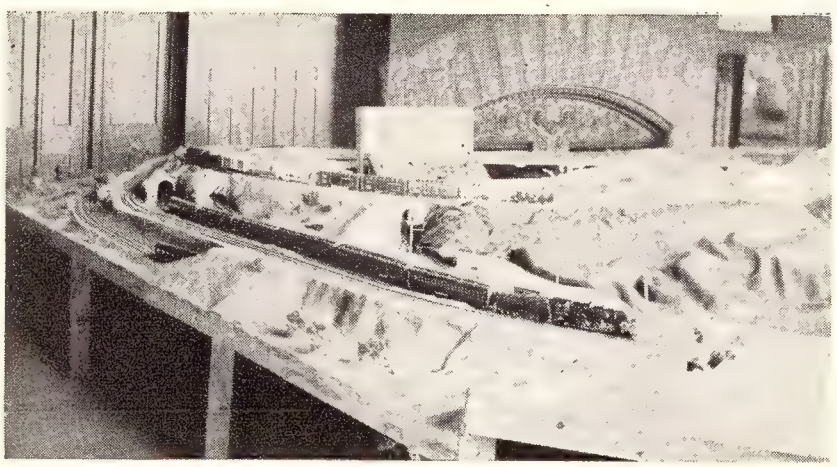
busy little town this is with a competing inter-urban line over to Tamaquay. Overlooking the town, to the South, we can see the famous High Top Mountains. As we leave town, the operator is holding the local freight on the By-Pass. This overtime job is headed by a Mogul #60. This little Mogul reminds one of the engines they have down in the Canal Zone.

We wend our way through deep cuts and the longest tunnel on the railroad. Ahead we can hear the engine chugging up grade. As we gradually climb out of the valley, we can see the Main Line tracks converging on us and we join them just as we come into Tamaquay.

A fine trip and we realize we had only been over half the trackage as with double track, the same trip could be taken in reverse. But, we saw all the sights and as we climb off in Jackson we are wondering if that mail pouch is still hanging out there in Wayout.



#65 climbing out of the valley while #35 rolls down from the mountain on the Philly Belt Line R.R.

Attention . . . TO YOUR TURNED FITTINGS

By JIM WILLIAMS

"YES, I made this locomotive — that is, all except the trucks and the drivers, the domes and the feedwater heater, the airpumps and the stack, the smokebox front and the cylinder block, and —" By the time you have enumerated a few of the parts you didn't make, don't you begin to wonder just what you really *did* build? Is it surprising that you begin to feel a bit apologetic about it? Of course, it all boils down to one thing — "no lathe."

For the chap who is handy enough with tools to build a locomotive, a few broad principles and a handful of tips should enable him to turn almost anything on the hand drill or breast drill that he can chuck. Parts that must be absolutely machine accurate excepted.

The first step is to set up the drill horizontally in the vice. When I use the hand drill, I grip the side grip boss in the jaws of the vice. When I use the breast drill, the knurled knob that locks the gears in place furnishes a handy grip for the vice jaws. Be careful to keep the gears clear. Better methods can be worked out no doubt.

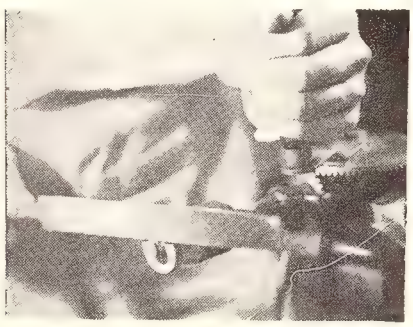
Many hand and breast drills have considerable wobble in the chuck shaft. This is not too important but if you can work a piece of shim brass into the chuck shaft bearing it will reduce excessive wobbling. Never mind about any looseness in the shoulder rest shaft and drive gear — it will not be transmitted to the work.

The next step is to chuck the rough material. The average breast drill will chuck ½" rod stock and most hand drills will take up to ⅜" material. When it comes to O gauge domes, smokebox fronts, etc., they should be drilled and tapped center, and a convenient size machine screw inserted to provide a stock or mandril upon which the chuck can get a grip. If you have no tap, drill a clearance hole. Before passing the screw through the material, thread on a nut and run it all the way on the screw. Chuck the screw with the work hard against the chuck jaws and use the nut as a jam nut, locking the piece against the chuck jaws. If a tap is used, this is not necessary as the work will rotate toward you and naturally jam itself firmly against the chuck.

For an example, let us take a simple turning, such as a feedwater heater. On a piece of rod stock of desired diameter, measure off the length of the piece plus a little bit to allow for dressing down the ends. Set up the work in your drill and cut off the excess rod stock, using the baby hacksaw as a cutoff tool. Before trying to use the saw, it is wise to make a little guiding groove for it with a 3-cornered file. If you have some one to turn the drill for you, this is not difficult, but if you have to turn with one hand and guide the tool with the other, you will have to make this first file cut bit-by-bit around the stock. This is to prevent the hacksaw wandering and marring the work when you start to turn. When you have your groove completed, hold the hacksaw in it while you merrily turn the drill to complete the cutoff.

At this point it would be well for you to note one basic principle of this type of turning. *The tool, whether saw or file, must be kept moving away from you* and through the work so that new teeth are constantly brought to bear and the old ones will have a chance to clear themselves of chips — otherwise the teeth will load up and cease to cut. Frequent use of a file card to clear the teeth is important.

Having cutoff our basic material we now come to the actual turning. You will note that there is an offset shoulder turned on each end of the feedwater heater and that the ends are rounded off. It is in making such cuts, as this offset, that the washer trick comes into play: Mark on the material where the shoulder is to end. Slip enough



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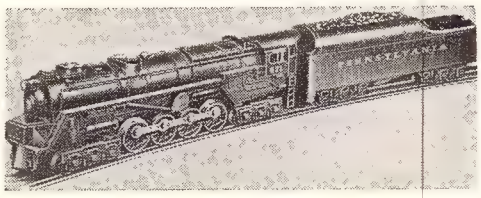

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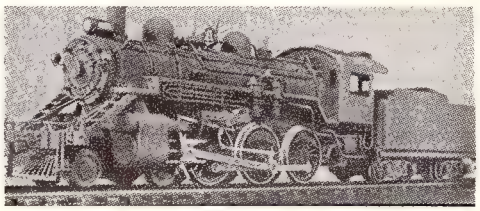

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washers over the work and against the chuck to prevent the tool from straying. If the washers hide the mark, it is alright as you can work down to exact dimensions after you have made the rough cut and removed the washers.

Using a bastard file held flat on the work and hard against the washers, you can now start turning. As the shoulder approaches specified diameter, use successively finer files. After cutting a good shoulder in the material, you may remove the washers and cut to the scribed line without fear of the tool slipping and damaging the job. When you have finished turning down the offset, take a 45 degree bevel cut with a medium flat file on the end and work it into a smoothly rounded corner. Wind up the end with fine emery cloth followed by a polish with worn-out emery cloth. Now reverse the material in the chuck. Wrap it from the chuck jaws. Then complete the other end in the same manner. A final polishing with worn-out fine emery cloth followed by pumice or tripoli will give you a job of which you may well be proud.

In general, it will be noted that the use of washers as cut spacers is especially helpful in making small cuts close together as in turning fins for airpump cylinders, etc.

Turnings frequently can be made best by assembly of separately turned layers. In the case of a smokebox cover, I turned four separate discs, as shown. After turning, the center one was peened out on a concave wooden block to the proper curvature. All discs were roughed out with the snips and the turning consisted principally of taking off the remaining corners, beveling the edge of some discs and giving all a good polish. Rivets were made in the larger disc with a center punch, backing the material up with a lead anvil. The threaded center hole used for the mandril screw afforded an excellent means of holding the assembly together while sweat soldering it.

Hand rail stanchions can be turned out almost free-hand, using stop washers for cutting the shoulder. Drill the material to take the handrail before you start turning and make all your measurements from this hole.

Breastdrill turning has one advantage over all but the very slowest lathe operation; it can be used to finish up and polish irregular curved parts, such as saddle type sand domes. Of course these have to be pretty well roughed out in the vise but when set up in the drill and turned at slow speed they can be nicely dressed down and polished. Turn slowly and permit the file to follow the contour of the work. Circular cover plates for sand domes can be turned integral with the dome by means of a variation of the washer trick. Before passing the mandril screw through the dome, pass it through a washer of the same diameter as the intended coverplate. This washer, chucked hard against the top of the dome, then offers a firm guide for the flat file while making a horizontal cut of the desired depth.

Cylinder blocks can be built up out of sheet brass, complete with drill turned saddle and drill turned cylinder-and-steamchest heads sweat soldered into place. Or, if you prefer, you may build up your block with curved recesses to take solid cylinders and steamchests, which can be turned from solid brass rod. Air tanks likewise can be turned from solid stock or you can use tubing of the proper size and turn rounded plugs with a shoulder to solder into the ends. Stacks can be turned complete from solid stock or heavy brass pipe. Although the bottom flange can be turned, a better job can be secured by turning the bottom end flush and using a flat piece of thin sheet brass complete with rivet detail between stack and smokebox. A small fillet of solder flowed into the corner between the stack and sheet brass can be dressed down into a very handsome three-dimensional flange. Complicated units, such as pumps, frequently have to be turned as a number of parts and assembled with screws and soldered.

Photos on the left from L. to R.

Illustrating how one or more washers are slipped over the work during turning to guide the tool and prevent marring the work. Note the setup of drill in vice and the tools on bench, including a blind file.

Washers removed, completing the cut started in first photo.

Variation of the washer trick. In this case, the washer is secured against the end of the work to act as a rest for the file while pressure is applied horizontally to cut an embossed circular cover-plate on top of the sand dome. A wide variety of washers is desirable.

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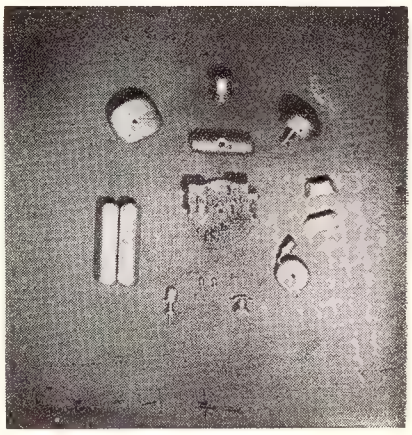
Best material is brass sheet and rod stock. Beware of aluminum which will "load" your files almost as quickly and permanently as lead, although some aluminum alloys cause less trouble in this respect than others. Soft steel can be easily turned but does not solder as well as brass. Medium hard copper is O. K.

One of the handiest tools for this kind of work is a medium size fine flat file with "blind" edges — that is with no teeth on the edges. You can make one of these by grinding the teeth from the edge of one of your files with an emery wheel. It has the advantage of enabling you to cut away one surface of a turning without danger of altering an adjacent surface at right angles to face being worked. If carelessly used, this file may leave a tiny fillet in corners, which can be removed with a few turns against a small 3 cornered file. The baby hacksaw is handiest for cutoffs and rattail files and half-round or greater size are handy for turning concave surfaces. Above all, frequent recourse to the hand calipers must be had in order to turn out reasonably accurate work.



A few fittings turned on the breastdrill, including saddletype sand dome, stack, circular sand dome, feedwater heater, smokebox front with double airpumps, air tanks, steam manifolds, water cooler, handrail stanchions, bell and steam dome with whistle.

Railroad Club News

SANTA BARBARA, CALIF. The Put en Take Railroad is permanently assigned as the meeting place for highly enjoyable executive committee meetings for the Pacific Coast Region of the NMRA. The owners, Jim and Ruth Dechert, can and shall be classed tops as host and hostess for any events, but they are only sorry that all the 1300 members of the P. C. R. cannot be present at their hilltop home just north of this city. When Jim finishes his unusual railroad complete with office, workshop and designing room (all in one), that locale is sure to be a popular place to congregate.

The very successful and hard-working executive committee met at this model pike recently to make preparations for the next P. C. R. meeting to be held at the East Bay Society Clubrooms. With enthusiasm running higher each month, this year should be an outstanding one for the P. C. R. under the able leadership of Jim Munson. 100% membership in the P. C. R. and the NMRA is fast becoming a *must* for all model railroad clubs in the region.

ELMWOOD, MASS. The South Shore Society of Model Engineers recently built an extensive layout for a local exhibit, the Brockton Fair. A space 20 x 40 feet was allotted to the club in the main exhibition building where a layout could be viewed by an estimated 250,000 people. The club deems this a very great honor in as much as they were approached and the costs are absorbed by the Fair Committee—the only cost to the club was in time which is naturally discounted as hobby fun. The entire layout becomes the property of the Club at the close of the Fair on Sept. 18. Lucky, or should we say Aggressive? Maybe both—but nevertheless, this is one club going places fast.

As for the layout, it consists of over 1200 feet of trackage. It is O gauge, polarized and 2-rail with Main Freight Yards, Mountain Freight Yards, Locomotive service yard and main line controls independent of each other. The main line is a loop-over-loop single track design with approximately 60% double track and with passing tracks and crossovers for left hand operation if desired.

All the railroad buildings, roundhouse, coaling station, water tank, sand drier and bin, shanties, etc., were furnished the club in kit form by the Model Structures Co. of Santa Cruz, Calif. The club built their own power pack and control panels. The entire layout is sectionalized into 13 tables for portability with all wire connections made through male and female plugs of the radio variety. Each building was illuminated, a total of 58 bulbs were used, which will surely enhance night operation. Motive power and rolling stock was furnished by club members, the Old Colony R.R. is the prototype.

The layout was a normal year and a half project, but by very close cooperation and endless concentration of all available time, the club was able to complete the project in a record time of four months excluding motive power and rolling stock.

The membership is only fifteen—but who says a small club can't do "Big Things?" Some people may think that the members themselves have pushed out of the fun department and into production, well, maybe they have just a little—but a $3,000 layout is well worth the effort, especially to a small club.

The boys have now eased off and enjoying their efforts with a little added details and much operation. *Note* that this layout is portable—they can give entertainments wherever there is room for a layout of this size. It is also ready built to move into their own quarters when the occasion requires with a minimum of construction due to the fact that the boys planned their work and followed through.

HAWTHORNE, CALIF. The Centinela Valley R.R. Club is taking advantage of the Southern California sunshine to push out the walls and expand their layout to super-duper proportions. Two new buildings 20 x 60' will be erected just south of the present layout headquarters and will house 2,000 feet of additional track, setting up three new stations, requiring five more operators. You can depend on a grand evening *any* Thursday. The C.V.R.R. runs on timetable operation. Time from a clock geared six to one runs off 12 hours of Railroad time for the schedule of its seventy-five trains. They now have a bulletin which is soon to come off the presses —the first issue of the "Valley Centinel." When in Southern California, the trip to Centinela Valley is a must.

PHILADELPHIA, PA. Don't forget the annual show of the Philadelphia Belt Line O gauge railroad. The show will be held at the B & O Station 24th and Chestnut Streets from October 16 to 24—weekdays from 7 to 11 P.M. and on Saturdays and Sundays from 2 to 10 P.M. Visiting clubs are welcome on Sundays from 11 A.M. to 2 P.M.

IRVINGTON, N. J. At the last club meeting of the North Jersey Midland Model R.R. it was decided to continue timetable operations every Monday night. This club actually publishes a timetable and they really stick to it. On July 25, the club meeting was held at the Dunellen, N. J. Round House where movies were shown plus the usual gab fest. A ride in the cab of a Diesel locomotive has been arranged for the near future for members of the Association only. Dave Sacks, Secretary of the Club, is now constructing a large OO pike—a two-rail affair approximately 20 x 30'. A single track is already running with a passing siding about six feet long. Visitors are welcome any night of the week—for information, contact the Secretary, 212 Maple Ave.

HORNELL, N. Y. One of the leading HO roads in the area, the New York Southern, would like to inaugurate the following program: an exchange of passes for their railroad with other model pikes regardless of gauge; they would also like to exchange (with HO gauge railroads only) 40' box cars, completely built of the same quality as Athearn box car kits lettered for the New York Southern with other cars lettered for the senders road. They believe this would add to the appearance of the roads of all concerned. Leo Roberts (7 Albion St.), president of the N. Y. S., would appreciate letters from anyone interested. All letters will be answered and details of models to be exchanged would be appreciated.

LOS ANGELES, CALIF. "This is My Railroad" was the subject of a picture in sound and color shown by the Southern Pacific Company to a capacity crowd in the clubrooms of the Metropolitan Model R.R. Club. Many clubs from the area were present at the showing of this $150,000 movie which was followed by operation on the club layout. Many crack trains were on hand and put through their paces—the photographers had a field day.

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We have established a "Registry Bureau" for the names of model railroads. By registering the name of your Road with this bureau you will be listed as the first claimant to that name, providing no one else has filed the same name with us with a prior date of establishment.

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.....

Owner's Name .....

Street Address .....

City ..... State .....

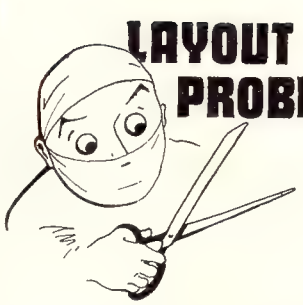
Date Name was adopted .....

Evidence ..... or

Witness (1) ..... (2) .....

Name & Address .....

Gauge ..... Remarks:



Each month in this space the layout Doctor will answer questions put to him in his fan mail. The questions will be reworded in the interests of brevity and clarity and attributed to a mythical person from a mythical locality since often essentially the same questions are asked by several persons. Questions not requiring extensive work will also be answered by mail if a stamped and addressed envelope is enclosed.

Sawbones, Ol' Pal:

I notice that in Directions you give for breaking your proposed layouts into sections you glibly say "sections may be wired up in parallel" or something like that. What do you mean by this and how do you do it?

(signed) Y. I. Skeeber, Applesas, W. Va.

Dear Y. I.:

Sometimes I forget that there are people who know even less about electricity than I do. I usually think in terms of two-rail where gaps must be provided to prevent short circuits. I try to place these gaps so as to cut the railroad up into convenient control sections such as one for coach yards, one for freight yards, one for single track and one for double track, etc., each one a section of track where a train might want to be stopped or reversed without regard to how other trains are running.

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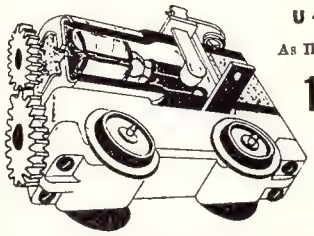

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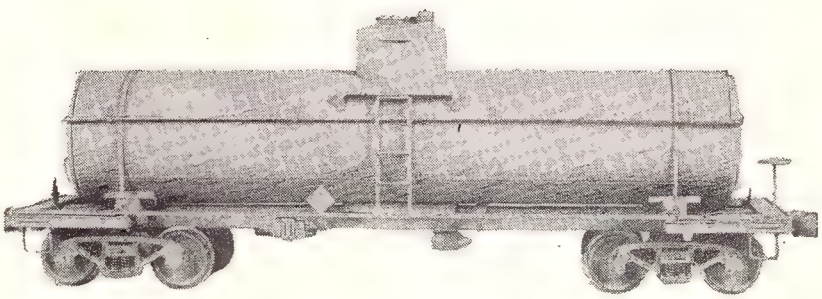

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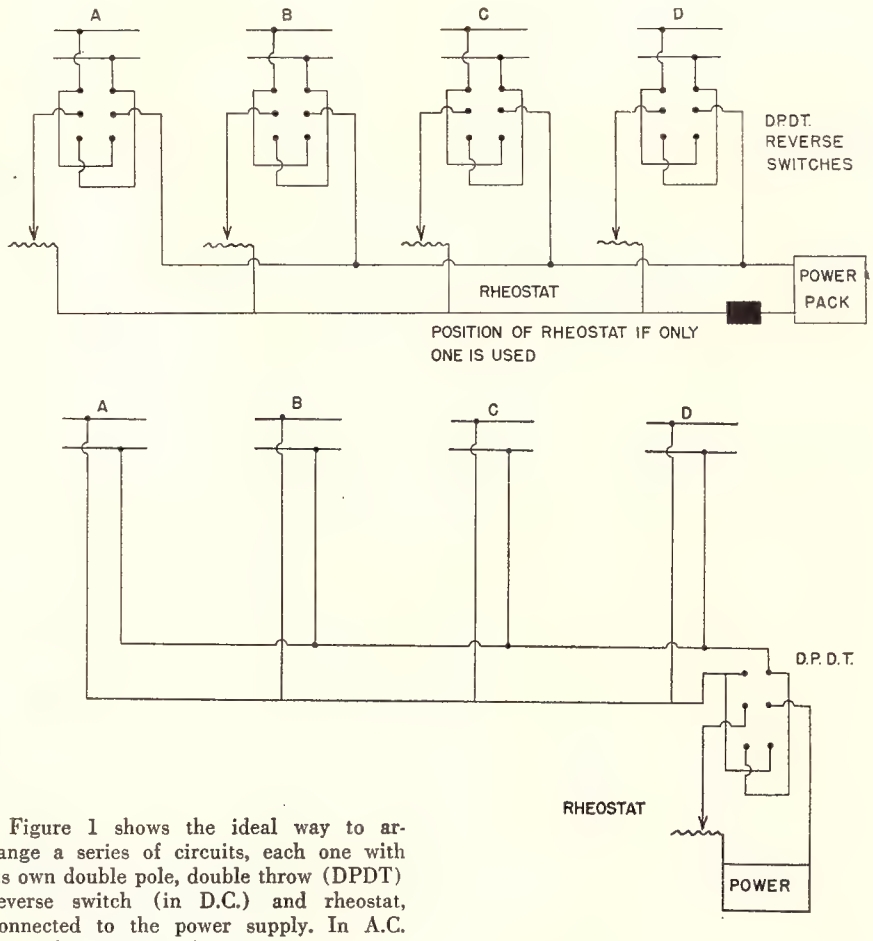

Figure 1 shows the ideal way to arrange a series of circuits, each one with its own double pole, double throw (DPDT) reverse switch (in D.C.) and rheostat, connected to the power supply. In A.C. or D.C. motors other than permanent magnet type, other types of reversing switches may be necessary either where shown or on each engine. If there is a shortage of expensive rheostats, one may be used temporarily placed where shown.

If there is a shortage of reverse switches as well as rheostats, the various sections may be wired as shown in Figure 2, all sections running through one rheostat and DPDT switch. All sections on any two-rail layout may be wired thus in parallel, except those which are part of a wye or reverse loop formation.

Why not, you may ask, Y. I., just run all track sections together and have just the one pair or wires running from track to reverse switch and rheostat? First of all, you would lose the sectionalization which you might want some day when your railroad and pocketbook are more advanced. Furthermore, the sectionalization is necessary for two-railing of a layout without excessive use of jumper wires. Incidentally, the sectionalization I show or suggest in my layouts each month is not the only possible one, although doubtless that by any other alleged expert would be similar.

Be sure your double pole double throw switches have a central OFF position so you don't have to exercise your wrist too much shutting off the rheostat each time you want to stop your train—it may look more realistic to have a train slow down before it stops, but it is a pain in the wrist when you are switching or backing and filling, feeling for an uncoupling ramp.

Dear Doc:

I am a young bucko, sixteen years old, who has been interested in model railroads since I was four years old. I have always prided myself in knowing such model technicalities as how to get continuous outside third rail through a scissors cross-over, and which manufacturer makes the *niftiest* diesel A unit. However, of late I have become intensely interested in another kind of models, preferably those in low cut scenery, or none at all! This means that I am neglecting my railroad

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models which sometimes worries me, but not much. What do you think?

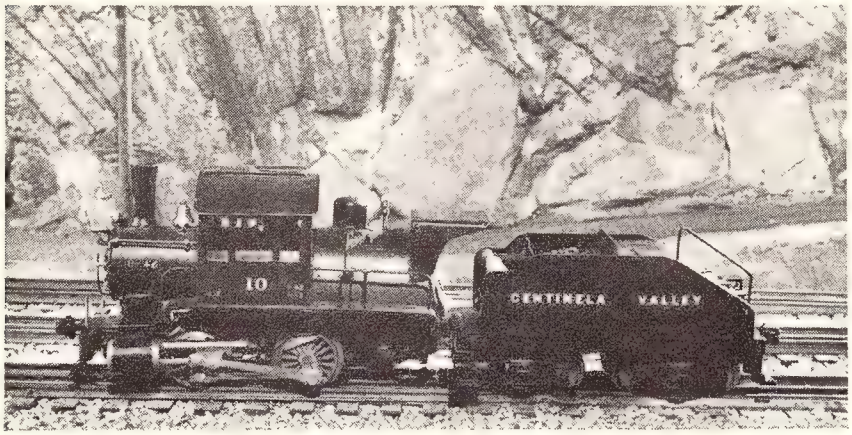
(signed) Watt A. Wolf, Hushpuppies Jct., La.

Dear Watt:

Someday you will realize, my boy, that the female form divine with both its ramifications is nothing but a trap set by Mother Nature for the hapless male. And Boy, what a trap!

Running Board Strip

Some people buy up cheap cigarette cases just to obtain material for running boards for their locomotives, now there is material available just for those super detailed jobs! It is a very realistic knurled brass strip, available in any of the popular gauges, and which can be easily soldered or brazed. The strip can be obtained from Herman Mitchell, Box 482, Bayville, N. Y.



Centinela Inspection Engine

By LEE P. RIDGEMAN

THE Lehigh Valley Inspection Engine "Dorothy" No. 1 served as the prototype for this O gauge Centinela Valley Inspection Engine, the "L. G. Arellanes No. 6." The engine was named after the Vice-president of the Centinela Club.

A 1930 Lionel Jr. motor, regeared 12 to 1 by using original armature gear and a Lionel fiber and steel reduction gear used in Lionel locomotives Nos. 260 and 258 power the model. All excess motor frame was cut away. The reason for using this type of motor is because of its small size, brush plate, etc., with a field winding suitable for operation on Centinela Valley's 16 volt DC. The driving wheels are old American Flyer O gauge Hudson type, 1½ inches in diameter. By using this combination, all gears matched perfectly.

A 1925 Ives passenger coach of the 6½, 60 series, served as the locomotive body. The ends were bent back between the window and door and the old door windows were made into the front and cab windows. The back windows were filed out larger to make them look different from the coach windows that serve as cab windows. A little work was also done on the car top to improve its appearance. Oblong holes were filed in top for the ventilators and green celluloid was glued over the holes from the inside.

The boiler was bolted to the motor frame with the dome, stack, front headlight and cylinders in the usual manner. The motor was installed very low between the drivers, about where the fire box should be (note photos). The motor lamination just clears the third rail and also note that the brush plate is between drivers.

The Tender is a solid block of lead with the coal bin cast right in. The tender and single truck is mounted rigid to motor frame, in other words, the driving and tender wheels guide the locomotive — the front trucks swing free. The complete assembly weighs 4¾ pounds — the driving wheel is the center of weight. The rigid wheel base is 3½ inches.

The car body has 14 bucket seats, seven on either side of the boiler. On board when the photos were taken were three crew members and seven big shots of the C. V. Both the front and back of the engine has working headlights and it also boasts one interior light. The engine stands 3½" from stack to rail; 2¼" wide and 8" long. The color scheme is maroon with white trim, gold lettering, hand rails, etc. The boiler is black with polished brass fittings, the underframe is dark green.

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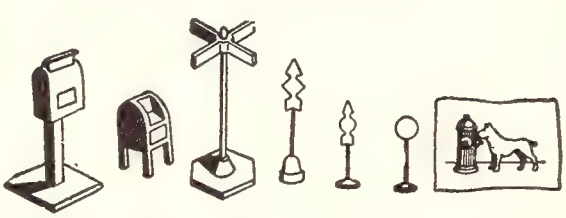

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STREAMLINED CARS

(*Continued from page* 31)

All windows may now be glazed by cementing celluloid or cellophane to the back of inner card board sheet and extending a quarter inch or more beyond the windows. The car sides may now be cemented in place on the assembled body.

Possibly it would be advantageous to paint the sides before glazing. Also, where stream painting and/or striping is used, decorators tape is useful. Sometimes called Scotch Tape, not to be confused with the transparent cellulose, it is an opaque gummed paper, usually grey or brown, which will adhere to a painted or plain surface to give a stop edge for the other color of panel or stripe. After the paint dries, the tape may be pulled off as you would remove adhesive tape or a bandaid.

Attaching the couplers and mounting the diaphrams were covered in articles on coaches, etc., in the two preceeding issues of Model Craftsman. Naturally the head end cars should match up with the rest of the train unless you are building a "Mixed Breed" in which event, most anything goes. The trucks for this car are the four wheel streamlined variety.

The Lackawanna baggage car, see drawing, is an old standard seventy-footer with a round roof. Many roads have stream painted similar cars—some have been rebuilt to partial streamline. With some variation however, this drawing is adaptable to most baggage cars.

The door arrangement varies with different prototypes. Generally a single door has a six foot opening, ¾ of an inch as shown in the drawing and a double door is eight feet, one inch on the drawing—these are shown one-half size for O gauge. The wider doors are generally the same distance from the end of car which shortens the distance to the center line. On cars having one six foot and one eight foot door, the wide one is to the left as you view the side of the car. Generally, four-wheel streamline trucks are used on the light weight equipment. Four wheel standard Pullman trucks are usual on standard cars with narrow doors and six wheel Pullman trucks are used on cars having one or both doors with wide openings. This is not a fast rule however, therefore the prototype will have to be observed either "in person" or from photographs. You will also note that some baggage cars have windows in their sides. These generally are used as storage mail cars—that is bulk or car load mail between distribution points.

The construction of the baggage car is the same as the mail of the several streamlined types having standard or full width diaphrams.

Since this is an old standard car with an end construction peculiar to the older baggage and mail cars with blind ends, let us consider this part of the car. (Without this change, this car is built the same as the several previously described cars.)

Make the ends as shown in the sketches. The ⅛" thick end is full width and the sides should finish flush with it. Cut the $\frac{3}{16}$" by $\frac{3}{16}$" end sill and fasten with cement and brads. Also the dummy buffer may be applied the same way. The door posts can now be fitted between the sill and the roof extension. Then cut off the end of roof as shown and finish the round end with file and sand paper.

The grab irons at the sides are the usual type and the so-called roof corner hand holds for box cars may be used at the ends as shown in the sketches. The double stirrup steps are standard. Couplers may be mounted as for the coaches. Four wheel trucks are mounted with centers as shown in the drawing. Six wheel trucks are spaced one half inch further from the car ends. This will also apply to old mail cars or any other type of equipment.

These cars are also adaptable to "0-72" tinplate. Reduce all dimensions for this purpose, as explained for coaches in the previous issue of the Craftsman.

The Lackawanna streamline colors are as follows: Letter board and side panel —Grey; Window strip—Red; Roof, end sills and underbody—black; and stripes at belt rail and floor—yellow.

Stripes and colors extend around the ends of car to diaphram on coaches or door posts on blind ends.

SAFETY VALVE

(*Continued from page* 4)

D. W. Massie, Ed Bergh, George Taylor, H. Coventry, Leslie Carter, and a host of others poured an ever increasing stream of their accomplishments and experiments into the common hopper of the Modelmaker, there to be disseminated all over the U. S. and Canada. Oh! Happy Days!

Who is to blame? The smug Live Steamer himself, secure in his acquired knowledge, who thinks he has reached the peak in his chosen hobby and forgets his less fortunate lone hand brother? Or the successor of the Modelmaker, the Model Craftsman, which at one time made an effort to spread the gospel, then, swept up in the whirlpool of hobbyists, an outgrowth of the kit form of "model engineering" (the screw-driver set), paid less and less attention to the poor constructor who required only a few rough castings and raw material to complete his project? Or was it lack of support from the lathe manufacturers and tool merchants, the suppliers of castings, fittings, and prints? I don't know. Maybe, a combination of all these ills has resulted in the throttling of the "live steam."

I understand that publishers claim that actually only about 5,000 people are interested in the *construction* of models and that this number is insufficient to support a magazine of the caliber of the 1934 Modelmaker. Granted that this argument has merit—isn't half a loaf better than none? From a slick magazine, tops in its field, to almost nothing is a terrific handicap to a fine hobby. The miracle is that, as stated above, the Live Steamers did not die, they merely went underground, so to speak, hoping to weather the onslaught of the aforementioned kit-con-

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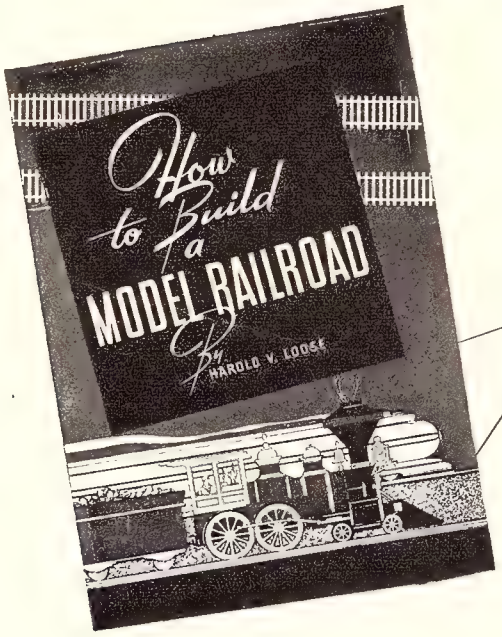

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struction craze. I have no quarrel with the airplane and race car devotees—I enjoy their spectacles, I envy their patience and ability in coaxing the last iota of power from their mighty mites. My plea is to the badly battered but unbowed *model-makers* to come out of hiding, let us regroup our forces—let us shout from the house-tops that we are vigourous, progressive, and a group to be reckoned with! We want a place in the sun!

Let the Craftsman invite correspondence and articles from clubs and individuals, allot at least a page or two in each issue to "live steam" subjects. If the bona-fide model trade advertise their wares. and the big tool people, also, it would have a beneficial effect on the magazine—after all, the Editor must eat! Above all, club secretaries of live steam groups and old, established model engineering societies should consistently insert their club news *with photos*, in the M.C.

I venture to state that if a determined effort by all interested parties is made concertedly, real model engineering, especially "live steam," will once more regain its rightful position—tops! Hopefully yours, Lary Dugan, San Francisco, Calif.

LAYOUT DOCTOR

(*Continued from page* 24)

Notice that I have moved the descending ramp from Flying W Jct. to Wyton out from the rising double track line. This is in order to swing a two-foot radius around the control panel bay with a minimum of waste space. The center and radius of this curve are shown by a dotted line since its correct location is important to the proper design of the yards.

Control sections have not been shown owing to the size of the layout which will have to be considerably reduced to get it into print. I would suggest one control section each for freight and passenger facilities and one for the oval Wyton-Zeeton-Flying W Jct.-Wyton *including* the trailing point (right hand) cross-over at the Jct. Each of the double tracks from that Jct. up to Riverside should also be a separate block, as should the track from Flying W Jct. down to Benchwood, and the reverse loop from Flying W Jct. to Exton and Wyton.

FREE LANCE DIESEL SWITCHER

(*Continued from page* 15)

a Varney turned bell. The bell hanger is a piece of $\frac{1}{32}$" wire. It is soldered to the hood and to the top of bell. The plastic tip from an old umbrella was cut down and formed into the headlight—a jewel was inserted. Drill a small hole in the hood and the piece of plastic. A Mantua tap was used so that the self-tapping screw would hold. It is screwed from under the hood into plastic. Between hood and headlight, a spacer washer was used similar to Mantua's side rod spacers.

The pick-up (Figure G) was made from a piece of spring steel wire. Bend to form an eye in the center of length of wire. Bend it down so it appears to droop for

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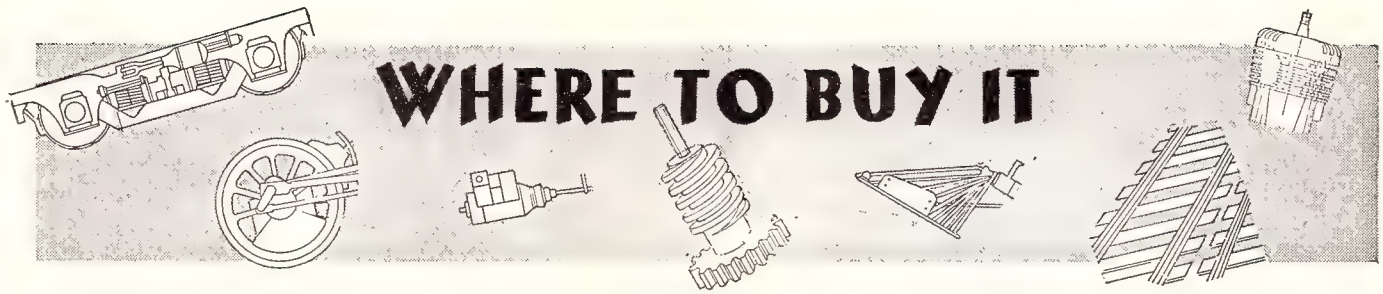

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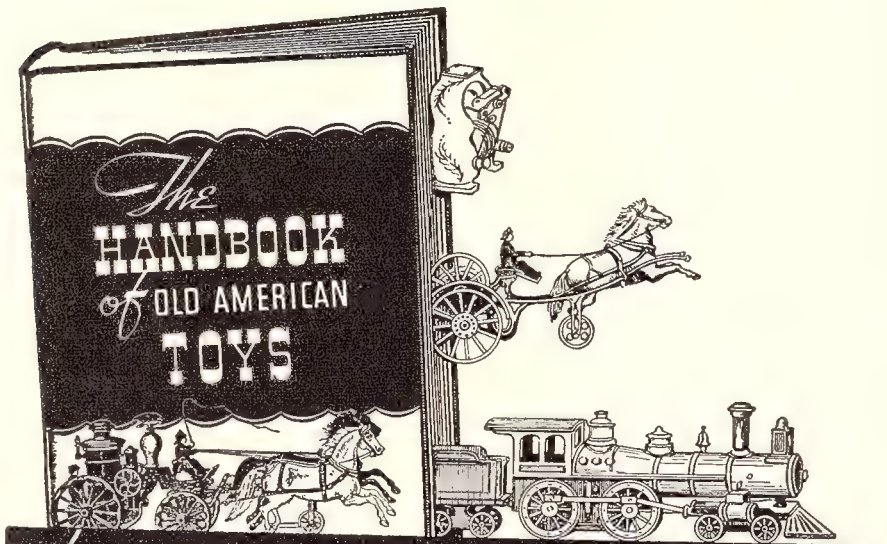

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it must have some pressure against the wheels.

The flexible lead from motor passes through a hole in deck next to the piece of rail at side and after passing through this hole, it is soldered to the piece of wire pick-up. Using a small block of wood, let's say about ½" long x $\frac{5}{16}$" wide x ⅛" thick, take a small wood screw and fasten the pick-up to block through the eye. (Figure E) Attach the block to underside of deck, inside of rail, on the correct side by another small wood screw. A small hole in deck just forward of cab will take it. One screw is sufficient—the one on my model hasn't come out for all the running it has done.

On the other side from the pick-up, I glued an HO air tank. This just fits between the wheels. The nib on one manufacturer's casting can be inserted in a hole drilled in the deck. Grind off any excess.

A hand rail from the cab to step can be installed; solder to cab and along upright of foot board. Grab iron for rear door can be soldered to rear cab piece. If you shun your engineer, keep him in the cab without additional windows. (Figure C2) To keep him healthy, you can add another window in the rear on right side.

Now paint your "Jeep" your own road colors and letter as you please, you fellows with long names will have to abbreviate. My pike is known as the Audray Lines and this easily fits on the cab sides.

TRAIN OF TOMORROW

(*Continued from page* 12)

while the interior is composed of thirty-seven colors. (These colors will be described in future issues). Each of the four cars features an Astra-Dome two feet above the car roof level. A six foot—two-inch depressed center aisle provides headroom. The entire train is air conditioned including the Astra-Domes. Fluorescent lighting is used throughout with some incandescent auxiliary lighting. A "Train to Anywhere" radiophone plus plug-in phone service while in stations is provided. Each car contains a small diesel generator which provides power for lighting, air conditioning and ventilation. This assures consistent temperature and lighting under all conditions.

LOCOMOTIVE

The locomotive is a standard 2.000 h.p. design capable of 100 m.p.h. Two 1.000 h.p.. two cycle, 12 cylinder, V-type General Motors engines drives the wheels through an electric transmission. This consists of a D.C. generator directly driven by each engine and a traction motor for each engine driving axle. The four traction motors are geared directly to the axles and are located in the trucks. The entire train from locomotive to lounge is "tight-lock" coupled thus eliminating the six to eight inches of slack between cars preventing "piling-up" and jerking in starts and stops. The center of gravity of the locomotive is low and utilizes outside swing hanger suspension. The trucks have short wheel bases which permits

curves to be taken with ease and safety. The cab is soundproofed and the windshield is fitted with wipers and defroster. Short nose and wide windows afford an excellent view of the right-of-way and approaches. The controls are similar in function to those of a steam locomotive, thereby assuring that veterans of steam operation can operate diesels after one or two trips with an instructor. Gauges, lights and bells register operating information for the safe and efficient operation of the train. A car to car telephone is installed for the use of the crew.

This month the locomotive was shown and in the next two months the four cars will be described and illustrated thereby completing the "Train of Tomorrow."

CONFESSIONS

(*Continued from page* 11)

make any such admission, but I certainly feel entitled to scream about the differences between the manufacturers' catalogue descriptions and the realities that come out of the kit-box. They can't kid the old hands much, certainly, and I see no point in their deluding the innocent new-comer with glib assurances of the ease, simplicity and total lack of previous skill needed to assemble these kits. Any newcomer less virulently inocculated by the bug than myself might well have not only thrown up his hands before now, but might conceivably have written his Congressman demanding action. In the future, manufacturers should specify "This kit requires extra fine screwdriver, needle-nose pliers and the ability to mind-read indecipherable diagrams to assemble same." Failure to give the new customer a sporting chance not only can drive such new customers right back in the street to stay, but may very well lead to an investigation of unfair trade practices on the part of an aroused and embittered Congress — even if I have to run for Congress myself!

However, I am not licked yet! It is still my present intention to proceed, winding up some years hence with one terrifically big model railroad that will likely take half the population of the county to operate. But I am going to start with the wooden-axle branch line first and see how it goes. Maybe that will either satisfy or cure me. If it does neither, I will expand until I *am* either satisfied, cured, or dead!

TROLLEY POLE BASES

(*Continued from page* 9)

ner described for the US-11 base. Spread the fork apart slightly so that the pole must be forced in place and will hold of its own accord. By clamping the outer end of the pole in a vise, the piston anchor, formed per detail Fig. E-6, can be held in place with one hand while the parts can be soldered into a unit with the other hand. Following this, remove the surplus cotter pin stock from the pole by the method previously described. The piston truss rod, noticeable in the side assembly view, is a short length of No. 28 wire soldered on top of the piston anchor and clamped to the pole at a point 1/3 the distance out from the hinge pin. Form the clamp by tightly wrapping a few turns of fine wire around the two parts, then sweating it into a solid mass that can be filed to resemble a metal band.

Material for the piston (Fig. E-8) is a common lath nail. Cut off the head, then use a jeweler's saw to cut a slot down the center for a distance of approximately ⅛". Pry this open, force in a piece of $\frac{1}{32}$" plate and squeeze the end to form a clevis. Finally, drill the indicated hole and trim to size. Make sure that the nail is a free fit in the cylinder, it should be dressed down with a file if there is any tendency to bind.

Final assembly consists of riveting in the fork and piston pins, both of which are No. 20 brads. Details of the spring and pull rod mechanism are as described for the US-11 pole base. Place the pole in the highest position it will go, then put slight force on the spring and solder the compression plate (Fig. E-9) fast to the pull rods.

The cylinder assembly acts as a slight damper, particularly when oiled, so you will find this base to be extremely smooth acting.

The Burning Problem

By H. J. MILLER

IN view of the fact that the power transformer plays such a vital part in the operation of model trains, signalling devices and electrical toys of every nature, its continued long life would seem to be of primary interest.

These transformers, whose function it is to "step down" the regular house circuit of 115 volts alternating current to the lower and varied voltages required by small equipments, are rather expensive, and, when abused by unlearned hands, soon burn out.

Greatest offender in these abuses is the inadvertent "short-circuit" caused by faulty devices or improper hookups. These overloads, causing a current drain exceeding the carrying capacity of the wire windings in the transformer, will, if not soon detected, cause it to "cook out."

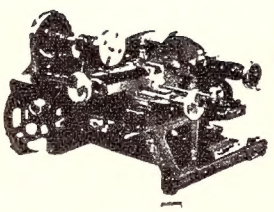
To completely offset this periodic and painful loss is the purpose of the hook up shown in the photos and sketch. It will be noted that the primary or 115 volt side of the transformer is connected in series with a parallel bank of lamps.

The output voltages can now be regulated by the simple expedient of loosening or tightening the bulbs in the bank, and or by increasing or decreasing their wattages.

By mounting the lampbank in a prominent position, the moment a "short" occurs, the lamps all light up giving a visual warning. Besides acting as a tell-tale, they immediately limit the current through the transformer to a value which is always below its rating because of the series-parallel lamp load. This always prevents the tragedy of a burn-out.

By using this system, my present transformer, a 300 watter, was been in active use for nine years.

Don't forget the World hobby exposition to be held in Philadelphia on November 15-20.



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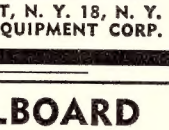

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S P 0-6-0 SWITCHER

(*Continued from page 6*)

them. After the rivet is squeezed with pliers the paper can be pulled out and the riveted joint will work freely.

The valve gear hanger is made next out of 1/64" sheet brass. The best way to shape the hanger is to lay it out on the sheet brass to the shape shown on the drawing. Drill the holes for riveting the valve gear to it and drill and file out the openings. The hanger can then be cut out roughly with shears and then finished up with a file. Bend the hanger to shape and clamp it in place on the loco frame. Drill a #50 hole through the hanger and into the frame. The hole in the frame is then tapped 2-56 and the hole in the hanger opened up to $\frac{3}{32}$". The hanger can then be fastened to the frame with a 2-56 screw.

Rivet the valve gear in place on the valve gear hanger. Also rivet the crossheads in place on the valve gear assembly. The eccentric cranks are filed to shape next out of $\frac{1}{16}$" thick brass. Drill the holes in the brass first and then file the cranks to the shape shown on the drawing. The rivets are too short to go through the eccentric cranks so it is necessary to solder the rivets in place. Put the rivet in the hole in the valve gear rod, then put a piece of paper on the rivet and push the rivet in the hole in the eccentric crank. Solder the rivet in place from the back of the crank. The paper is to prevent the solder from flowing on the rod and soldering the joint up tight. The rivet has to turn in the hole in the rod.

All that remains is to make the air brake cylinders and rods on the back end of the frame and solder them in place. The cylinders are turned out of $\frac{1}{8}$" brass rod and the rods are cut out of 1/64" sheet brass. Solder the brake cylinders in place first and then solder on the rods and brackets.

Before assembling the completed mechanism it will be best to paint the parts. I use flat black paint on my models. This paint gives the models a nice dull finish and is available in most hobby stores. Start assembling the model by mounting the drivers in the frame and fastening the side rods in place. The cylinder block can then be fastened to the frame and the main rods put in place on the main crankpins. The valve gear assembly which consists of the valve gear hanger, valve gear, crossheads and eccentric cranks can now be mounted in place. Fasten the main rods to the crossheads with 0-80 screws and slip the eccentric cranks in place on the crankpins. Be sure to put washers between the main and side rods and also between the main rods and eccentric cranks. Also put a piece of paper on each crankpin between the eccentric crank and the washer. The cranks can then be soldered in place on the crankpins. The paper will prevent the solder from flowing down the crankpin. The excess length of the crankpins can then be filed off. The crankpins should be flush with the surfaces of the eccentric cranks. Test the mechanism to make sure that nothing is binding and then mount the motor. This completes the mechanism.

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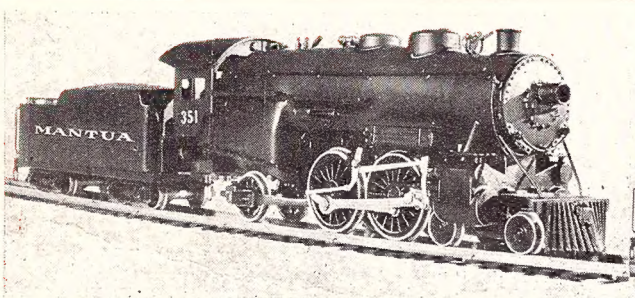

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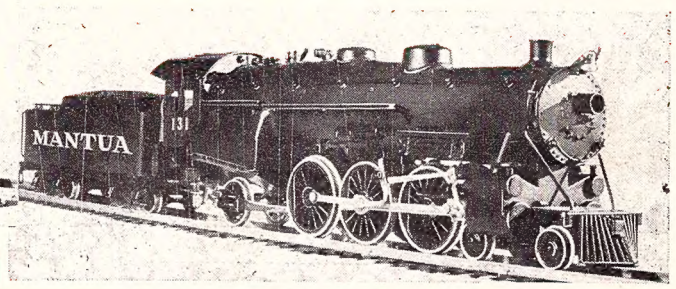

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